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**GEORGE WASHINGTON KENNEDY.**

Born at Philadelphia, Pa., February 22, 1843. Died at Pottsville, Pa., December 22, 1902.

Secretary of the Council, American Pharmaceutical Association, 1880–1903.

Secretary of the Committee on Membership, 1875–1903.

PROCEEDINGS

OF THE

# AMERICAN

# PHARMACEUTICAL ASSOCIATION

AT THE

## FIFTY-FIRST ANNUAL MEETING

HELD AT

MACKINAC ISLAND, MICH., AUGUST, 1903.

ALSO THE

CONSTITUTION, BY-LAWS AND ROLL OF MEMBERS.

BALTIMORE:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1903.


INITIAL MEETING AT NEW YORK 1851.
AMERICAN
PHARMACEUTICAL
ASSOCIATION
INCORPORATED AT
WASHINGTON, D.C.
FEB'Y 21.
1888.
ORGANIZED AT PHILADELPHIA-1852.

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| " | Clement B. Lowe | Philadelphia, Pa. |
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| *Texas.* | I. F. Orton, Galveston. |
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S. B. Carey.
A. Breunert.
J. Geo. Wirthman.
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Samuel Gordon.
G. Q. Lake.
O. H. Gentry.

# LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION.

(DECEASED IN ITALICS.)

| Date. | Place of Meeting. | Presidents. | First Vice-Presidents. | Second Vice-Presidents. | Third Vice-Presidents. |
|---|---|---|---|---|---|
| Oct. 6, 1852.. | Philadelphia, Pa.... | *Daniel B. Smith*, Philadelphia. | *George W. Andrews*, Baltimore. | *Samuel M. Colcord*, Boston. | *C. Augustus Smith*, Cincinnati. |
| Aug. 24, 1853.. | Boston, Mass..... | *William A. Brewer*, Boston. | *George D. Coggeshall*, New York. | *Alexander Duval*, Richmond, Va. | Charles B. Guthrie, Memphis, Tenn. |
| July 25, 1854.. | Cincinnati, O..... | *William B. Chapman*, Cincinnati. | *Henry T. Cummings*, Portland, Me. | *John Meakim*, New York. | *Joseph Laidley*, Richmond, Va. |
| Sept. 11, 1855.. | New York, N. Y.... | *John Meakim*, New York. | Charles B. Guthrie, Memphis, Tenn. | *Charles Ellis*, Philadelphia. | *Henry F. Fish*, Waterbury, Conn. |
| Sept. 9, 1856.. | Baltimore, Md..... | *George W. Andrews*, Baltimore. | *John L. Kidwell*, Washington, D. C. | Frederick Stearns, Detroit, Mich. | *Henry T. Kiersted*, New York. |
| Sept. 8, 1857.. | Philadelphia, Pa. ... | *Charles Ellis*, Philadelphia. | *James Cooke*, Fredericksburg, Va. | *Samuel P. Peck*, Bennington, Vt. | A. E. Richards, Plaquemine, La. |
| Sept. 14, 1858.. | Washington, D. C... | *John L. Kidwell*, Georgetown, D. C. | *Edward R. Squibb*, Brooklyn, N. Y. | *James O'Gallagher*, St. Louis. | Robert Battey, Rome, Ga. |
| Sept. 13, 1859.. | Boston, Mass..... | *Samuel M. Colcord*, Boston. | *William Procter, Jr.*, Philadelphia. | *Joseph Roberts*, Baltimore. | Edwin O. Gale, Chicago. |
| Sept. 11, 1860.. | New York, N. Y.... | *Henry T. Kiersted*, New York. | William J. M. Gordon, Cincinnati. | *William S. Thompson*, Baltimore. | *Theodore Metcalf*, Boston. |
| Aug. 27, 1862.. | Philadelphia, Pa. ... | *William Procter, Jr.*, Philadelphia. | *John Milhau*, New York. | *Eugene L. Massot*, St. Louis. | *J. Faris Moore*, Baltimore. |
| Sept. 8, 1863.. | Baltimore, Md..... | *J. Faris Moore*, Baltimore. | *John M. Maisch*, Philadelphia. | *Chas. A. Tufts*, Dover, N. H. | *George W. Weyman*, Pittsburg. |
| Sept. 21, 1864.. | Cincinnati, O..... | William J. M Gordon, Cincinnati. | *Richard H. Stabler*, Alexandria, Va. | Enno Sander, St. Louis. | *Thomas Hollis*, Boston. |

| Date. | Place of Meeting. | Presidents. | First Vice-Presidents. | Second Vice-Presidents. | Third Vice-Presidents. |
|---|---|---|---|---|---|
| Sept. 5, 1865.. | Boston, Mass..... | *Henry W. Lincoln*, Boston. | *George C. Close*, Brooklyn, N. Y. | *Elijah W. Sackrider*, Cleveland, O. | *Charles A. Heinitsh.* Lancaster, Pa. |
| Aug. 22, 1866.. | Detroit, Mich..... | Frederick Stearns, Detroit, Mich. | *Edward Parrish*, Philadelphia. | Ezekiel H. Sargent, Chicago. | *John W. Shedden*, New York. |
| Sept. 10, 1867.. | New York, N. Y..... | *John Milhau*, New York. | *Robert J. Brown*, Leavenworth, Kan. | *N. Hynson Jennings*, Baltimore. | *Daniel Henchman*, Boston. |
| Sept. 8, 1868.. | Philadelphia, Pa.... | *Edward Parrish*, Philadelphia. | *Ferris Bringhurst*, Wilmington, Del. | *Edward S. Wayne*, Cincinnati. | Albert E. Ebert, Chicago. |
| Sept. 7, 1869.. | Chicago, Ill..... | Ezekiel H. Sargent, Chicago. | *Ferdinand W. Sennewald*, St. Louis. | *John H. Pope*, New Orleans. | Joel S. Orne, Cambridgeport, Mass. |
| Sept. 13, 1870.. | Baltimore, Md..... | *Richard H. Stabler.* Alexandria, Va. | Fleming G. Grieve, Milledgeville, Ga. | James G. Steele, San Francisco. | *Eugene L. Massot*, St. Louis. |
| Sept. 12, 1871.. | St. Louis, Mo ..... | Enno Sander, St. Louis. | C. Lewis Diehl, Louisville, Ky. | *George F. H. Markoe*, Boston. | *Matthew F. Ash*, Jackson, Miss. |
| Sept. 3, 1872.. | Cleveland, O. ..... | Albert E. Ebert, Chicago. | *Samuel S. Garrigues*, East Saginaw, Mich. | Edward P. Nichols, Newark, N. J. | *Henry C. Gaylord*, Cleveland, O. |
| Sept. 16, 1873.. | Richmond, Va..... | John F. Hancock, Baltimore. | William Saunders, London, Ont. | John T. Buck, Jackson, Miss. | *Paul Balluff*, New York. |
| Sept. 8, 1874.. | Louisville, Ky..... | C. Lewis Diehl, Louisville, Ky. | *Joseph Roberts*, Baltimore. | William T. Wenzell, San Francisco. | *Augustus R. Bayley*, Cambridgeport, Mass. |
| Sept. 7, 1875.. | Boston, Mass..... | *George F. H. Markoe*, Boston. | Frederick Hoffmann, New York. | T. Roberts Baker, Richmond, Va. | Christian F. G. Meyer, St. Louis. |
| Sept. 12, 1876.. | Philadelphia, Pa.... | *Charles Bullock*, Philadelphia. | Samuel A. D. Sheppard, Boston. | *Gustavus J. Luhn*, Charleston, S. C. | *Jacob D. Wells*, Cincinnati. |
| Sept. 4, 1877.. | Toronto, Can..... | William Saunders, London, Ont. | Ewen McIntyre, New York. | *John Ingalls*, Macon, Ga. | *Emlen Painter*, San Francisco. |

## LIST OF OFFICERS (Continued).

| Date. | Place of Meeting. | Presidents. | First Vice-Presidents. | Second Vice-Presidents. | Third Vice-Presidents. |
|---|---|---|---|---|---|
| Nov. 26, 1878.. | Atlanta, Ga..... | *Gustavus J. Luhn*, Charleston, S. C. | *Frederick T. Whiting*, Great Barrington, Mass. | Henry J. Rose, Toronto, Can. | *William H. Crawford*, St. Louis. |
| Sept. 9, 1879.. | Indianapolis, Ind. .. | *George W. Sloan*, Indianapolis, Ind. | T. Roberts Baker, Richmond, Va. | Joseph L. Lemberger, Lebanon, Pa. | Philip C. Candidus, Mobile, Ala. |
| Sept. 14, 1880.. | Saratoga, N. Y. .... | James T. Shinn, Philadelphia. | George H. Schafer, Fort Madison, Ia. | *William S. Thompson*, Washington, D. C. | William Simpson, Raleigh, N. C. |
| Aug. 23, 1881.. | Kansas City, Mo.... | *P. Wendover Bedford*, New York. | *Emlen Painter*, San Francisco. | George Leis, Lawrence, Kan. | *John F. Judge*, Cincinnati. |
| Sept. 12, 1882.. | Niagara Falls, N. Y.. | *Charles A. Heinitsh.* Lancaster, Pa. | *John Ingalls*, Macon, Ga. | Louis Dohme, Baltimore. | *William B. Blanding*, Providence, R. I. |
| Sept. 11, 1883.. | Washington, D. C... | *William S. Thompson*, Washington, D. C. | *Charles Rice*, New York. | *Frederick H. Masi*, Norfolk, Va. | Edward W. Runyon, San Francisco. |
| Aug. 26, 1884.. | Milwaukee, Wis .... | *John Ingalls*, Macon, Ga. | *John A. Dadd*, Milwaukee, Wis. | Henry Canning, Boston. | *Charles F. Goodman*, Omaha, Neb. |
| Sept. 8, 1885.. | Pittsburgh, Pa..... | *Joseph Roberts*, Baltimore. | Albert H. Hollister, Madison, Wis. | Albert B. Prescott, Ann Arbor, Mich. | Joseph S. Evans, West Chester, Pa. |
| Sept. 7, 1886.. | Providence, R. I.... | *Chas. A. Tufts*, Dover, N. H. | *Henry J. Menninger*, Brooklyn, N. Y. | *M. W. Alexander*, St. Louis. | Norman A. Kuhn, Omaha, Neb. |
| Sept. 5, 1887.. | Cincinnati, O..... | John U. Lloyd, Cincinnati. | *M. W. Alexander*, St. Louis. | A. K. Finlay, New Orleans. | Karl Simmon, St. Paul, Minn. |
| Sept. 3, 1888.. | Detroit, Mich ..... | *M. W. Alexander*, St. Louis. | Jas. Vernor, Detroit, Mich. | *Fred. Wilcox*, Waterbury, Conn. | Alvin A. Yeager, Knoxville, Tenn. |
| June 24, 1889.. | San Francisco, Cal.. | *Emlen Painter*, New York. | Karl Simmon, St. Paul, Minn. | Wm. M. Searby, San Francisco. | Jos. W. Eckford, Aberdeen, Miss. |
| Sept. 8, 1890.. | Old Pt. Comfort, Va. | *A. B. Taylor*, Philadelphia. | A. B. Stevens, Ann Arbor, Mich. | Chas. E. Dohme, Baltimore. | Jas. M. Good, St. Louis. |

# LIST OF OFFICERS (Concluded).

| Date. | Place of Meeting. | Presidents. | First Vice-Presidents. | Second Vice-Presidents. | Third Vice-Presidents. |
|---|---|---|---|---|---|
| April 27, 1891.. | New Orleans, La.... | A. K. Finlay, New Orleans. | Geo. J. Seabury, New York. | W. H. Torbert, Dubuque, Ia. | L. T. Dunning, Sioux Falls, S. Dak. |
| July 14, 1892.. | Profile House, N. H. | Jos. P. Remington, Philadelphia. | A. P. Preston, Portsmouth, N. H. | Sidney P. Watson, Atlanta, Ga. | Wm. H. Averill, Frankfort, Ky. |
| Aug. 14, 1893.. | Chicago, Ill..... | Edgar L. Patch, Boston. | Leo Eliel, South Bend, Ind. | Wiley Rogers, Louisville, Ky. | Chas. Caspari, Jr., Baltimore. |
| Sept. 3, 1894.. | Asheville, N. C. .... | William Simpson, Raleigh, N. C. | Chas. M. Ford, Denver, Colo. | Jno. N. Hurty, Indianapolis, Ind. | Jos. E. Morrison, Montreal, Can. |
| Aug. 14, 1895.. | Denver, Colo. ..... | James M. Good, St. Louis. | Chas. E. Dohme, Baltimore. | Adolph Brandenberger, Jefferson City, Mo. | Mrs. M. O. Miner, Hiawatha, Kan. |
| Aug. 12, 1896.. | Montreal, Can ..... | Joseph E. Morrison, Montreal, Can. | Geo. F. Payne, Atlanta, Ga. | Wm. A. Frost, St. Paul, Minn. | Geo. W. Parisen, Perth Amboy, N. J. |
| Aug. 23, 1897.. | Lake Minnetonka, Minn ..... | *Henry M. Whitney*, Lawrence, Mass. | George C. Bartells, Camp Point, Ills. | *Wm. S. Thompson*, Washington, D. C. | Jacob A. Miller, Harrisburg, Pa. |
| Aug. 29, 1898.. | Baltimore, Md ..... | Charles E. Dohme, Baltimore. | George F. Payne, Atlanta, Ga. | James H. Beal, Scio, O. | Miss Josie A. Wanous, Minneapolis, Minn. |
| Sept. 4, 1899.. | Put-in-Bay, O ..... | Albert B. Prescott, Ann Arbor, Mich. | Lewis C. Hopp, Cleveland, O. | Wm. L. Dewoody, Pine Bluff, Ark. | Henry R. Gray, Montreal, Can. |
| May 7, 1900.. | Richmond, Va. .... | Jno. F. Patton, York, Pa. | James H. Beal, Scio, O. | Jno. W. Gayle, Frankfort, Ky. | E. A. Ruddiman, Nashville, Tenn. |
| Sept. 16, 1901.. | St. Louis, Mo..... | Henry M. Whelpley, St. Louis. | Wm. M. Searby, San Francisco. | George F. Payne, Atlanta, Ga. | *Wm. S. Thompson*, Washington, D. C. |
| Sept. 8, 1902.. | Philadelphia, Pa.... | Geo. F. Payne, Atlanta, Ga. | Wm. L. Cliffe, Philadelphia, Pa. | Eugene G. Eberle, Dallas, Texas. | Henry Willis, Quebec, Can. |
| Aug. 3, 1903... | Mackinac Island, Mich..... | Lewis C. Hopp, Cleveland, O. | Wm. C. Alpers, New York, N. Y. | Albert M. Roehrig, Stapleton, N. Y. | Otto F. Claus, St. Louis, Mo. |

## TREASURERS.

*Alfred B. Taylor*, Philadelphia, 1852–54.
*Samuel M. Colcord*, Boston, 1854–56, and 1857–59.
*James S. Aspinwall*, New York, 1856–57.
*Ashel Boyden*, Boston, 1859–60.
*Henry Haviland*, New York, 1860–63.
*J. Brown Baxley*, Baltimore, 1863–65.
*Charles A. Tufts*, Dover, N. H., 1865–86.
Samuel A. D. Sheppard, Boston, 1886–1904.

## RECORDING SECRETARIES.

*George D. Coggeshall*, New York, 1852–53.
*Edward Parrish*, Philadelphia, 1853–54.
*Edward S. Wayne*, Cincinnati, 1854–55.
William J. M. Gordon, Cincinnati, 1855–59.
*Charles Bullock*, Philadelphia, 1859–60.
James T. Shinn, Philadelphia, 1860–62.
*Peter W. Bedford*, New York, 1862–63.
William Evans, Jr., Philadelphia, 1863–64.
Henry N. Rittenhouse, Philadelphia, 1864–65.

## CORRESPONDING SECRETARIES.

*William Procter, Jr.*, 1852–53, and 1854–57.
*William B. Chapman*, Cincinnati, 1853–54.
*Edward Parrish*, Philadelphia, 1857–58.
*Ambrose Smith*, Philadelphia, 1858–59.
*William Hegeman*, New York, 1859–60.
*Peter W. Bedford*, New York, 1860–62, and 1863–65.
*John M. Maisch*, Philadelphia, 1862–63.

## PERMANENT SECRETARIES.

*John M. Maisch*, Philadelphia, 1865–Sept., 1893.
Henry M. Whelpley, St. Louis (acting), August, 1893.
Joseph P. Remington, Philadelphia, 1893–94.
Chas. Caspari, Jr., Baltimore, 1894–96.

## GENERAL SECRETARY.

Chas. Caspari, Jr., Baltimore, 1896–1904.

## LOCAL SECRETARIES.

| For the meeting held in | | | | | |
|---|---|---|---|---|---|
| 1867 | *P. Wendover Bedford.* | 1872 | *Henry C. Gaylord.* | 1877 | Henry J. Rose. |
| 1868 | *Alfred B. Taylor.* | 1873 | Thomas H. Hazard. | 1878 | *Jesse W. Rankin.* |
| 1869 | *Henry W. Fuller.* | 1874 | *Emil Scheffer.* | 1879 | *Eli Lilly.* |
| 1870 | *J. Faris Moore.* | 1875 | Samuel A. D. Sheppard. | 1880 | Charles F. Fish. |
| 1871 | *William H. Crawford.* | 1876 | Adolphus W. Miller. | 1881 | William T. Ford. |

## LOCAL SECRETARIES.—*Concluded.*

| For the meeting held in | | For the meeting held in | | For the meeting held in | |
|---|---|---|---|---|---|
| 1882 | *Hiram E. Griffith.* | 1890 | Charles E. Dohme. | 1898 | Henry P. Hynson. |
| 1883 | Charles Becker. | 1891 | A. K. Finlay. | 1899 | Lewis C. Hopp. |
| 1884 | Henry C. Schranck. | 1892 | *H. M. Whitney.* | 1900 | T. Ashby Miller. |
| 1885 | *George A. Kelly.* | 1893 | Henry Biroth. | 1901 | H. M. Whelpley. |
| 1886 | *William B. Blanding.* | 1894 | W. G. Smith. | 1902 | Wm. L. Cliffe. |
| 1887 | George W. Voss. | 1895 | Edm. L. Scholtz. | 1903 | F. W. R. Perry. |
| 1888 | James Vernor. | 1896 | Joseph E. Morrison. | 1904 | Joseph C. Wirthman. |
| 1889 | Edward W. Runyon. | 1897 | Edw. Shumpik. | | |

## REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873-91, and 1895–1904. *Chas. Rice*, New York, N. Y., 1891–92. Henry Kraemer, New York, N. Y., 1892–95.

## OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

| | *Chairman.* | *Vice-Chairman.* | *Secretary.* |
|---|---|---|---|
| 1880–81 | Jos. P. Remington. | *Joseph Roberts.* | *Geo. W. Kennedy.* |
| 1881–82 | " " | Wm. J. M. Gordon. | " " |
| 1882–83 | " " | " " | " " |
| 1883–84 | " " | C. Lewis Diehl. | " " |
| 1884–85 | " " | *John A. Dadd.* | " " |
| 1885–86 | " " | C. Lewis Diehl. | " " |
| 1886–87 | *Wm. S. Thompson.* | *H. J. Menninger.* | " " |
| 1887–88 | Wm. H. Rogers. | Karl Simmon. | " " |
| 1888–89 | Jas. M. Good. | *Emlen Painter.* | " " |
| 1889–90 | " " | *Wm. S. Thompson.* | " " |
| 1890–91 | " " | " " | " " |
| 1891–92 | " " | " " | " " |
| 1892–93 | " " | *H. M. Whitney.* | " " |

## OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.—*Continued.*

| | *Chairman.* | *Vice-Chairman.* | *Secretary.* |
|---|---|---|---|
| 1893–94 | Jas. M. Good. | *H. M. Whitney.* | *Geo. W. Kennedy.* |
| 1894–95 | *Wm. S. Thompson.* | " " | " " |
| 1895–96 | " " | Wm. C. Alpers. | " " |
| 1896–97 | " " | Jas. M. Good. | " " |
| 1897–98 | " " | " " | " " |
| 1898–99 | " " | " " | " " |
| 1899–00 | " " | " " | " " |
| 1900–01 | " " | " " | " " |
| 1901–02 | A. B. Prescott. | Chas. E. Dohme. | " " |
| 1902–03 | James H. Beal. | Lewis C. Hopp. | Henry M. Whelpley. |
| 1903–04 | " " | Leo Eliel. | " " |

## PAST AND PRESENT OFFICERS OF THE SECTIONS.

### Section on Commercial Interests.

| | *Chairman.* | *Secretary.* |
|---|---|---|
| 1887–88 | A. H. Hollister. | *J. W. Colcord.* |
| 1888–89 | " " | " " |
| 1889–90 | Leo Eliel. | F. B. Kilmer. |
| 1890–91 | Henry Canning. | W. L. Dewoody. |
| 1891–92 | W. H. Torbert. | Arthur Bassett. |
| 1892–93 | " " | " " |
| 1893–94 | Wiley Rogers. | Jas. O. Burge. |
| 1894–95 | Geo. J. Seabury. | " " |
| 1895–96 | " " | Clay W. Holmes. |
| 1896–97 | Lewis C. Hopp. | E. D'Avignon. |
| 1897–98 | Joseph Jacobs. | Jas. H. Bobbitt. |
| 1898–99 | " " | " " |

### Section on Scientific Papers.

| | *Chairman.* | *Secretary.* |
|---|---|---|
| 1887–88 | T. Roberts Baker. | A. B. Lyons. |
| 1888–89 | *Emlen Painter.* | H. M. Whelpley. |
| 1889–90 | H. M. Whelpley. | C. F. Dare. |
| 1890–91 | E. L. Patch. | C. S. N. Hallberg. |
| 1891–92 | C. S. N. Hallberg. | H. W. Snow. |
| 1892–93 | C. T. P. Fennel. | F. G. Ryan. |
| 1893–94 | L. E. Sayre. | C. M. Ford. |
| 1894–95 | A. R. L. Dohme. | Geo. B. Kauffman. |
| 1895–96 | S. P. Sadtler. | W. C. Alpers. |
| 1896–97 | W. C. Alpers. | V. Coblentz. |
| 1897–98 | Edward Kremers. | A. B. Lyons. |
| 1898–99 | Henry H. Rusby. | H. V. Arny. |

SECTION ON COMMERCIAL INTERESTS.—*Con.*

| | *Chairman.* | *Secretary.* |
|---|---|---|
| 1899–00 | Jas. M. Good. | Chas. A. Rapelye. |
| 1900–01 | Chas. A. Rapelye. | F. W. Meissner. |
| 1901–02 | F. W. Meissner. | E. G. Eberle. |
| 1902–03 | Thos. V. Wooten. | Wm. C. Anderson. |
| 1903–04 | Wm. L. Dewoody. | R. C. Reilly. |

SECTION ON PHARMACEUTICAL EDUCATION.

| | *Chairman.* | *Secretary.* |
|---|---|---|
| 1887–88 | *John F. Judge.* | H. M. Whelpley. |
| 1888–89 | *P. W. Bedford.* | L. E. Sayre. |

SECTION ON PHARMACEUTICAL LEGISLATION.

| | *Chairman.* | *Secretary.* |
|---|---|---|
| 1887–88 | R. F. Bryant. | W. P. De Forest. |
| 1888–89 | C. W. Day. | J. N. Hurty. |

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

| | *Chairman.* | *Secretary.* |
|---|---|---|
| 1889–90 | *P. W. Bedford.* | A. B. Stevens. |
| 1890–91 | Wm. Simon. | L. C. Hogan. |
| 1891–92 | A. B. Stevens. | " " |
| 1892–93 | R. G. Eccles. | " " |
| 1893–94 | " " | " " |
| 1894–95 | Jas. M. Good. | C. S. N. Hallberg. |

SECTION ON SCIENTIFIC PAPERS.—*Con.*

| | *Chairman.* | *Secretary.* |
|---|---|---|
| 1899-00 | Frank G. Ryan. | Caswell A. Mayo. |
| 1900–01 | Oscar Oldberg. | Lyman F. Kebler. |
| 1901–02 | Lyman F. Kebler. | Jos. W. England. |
| 1902–03 | J. O. Schlotterbeck. | " " " |
| 1903–04 | Wm. A. Puckner. | Eustace H. Gane. |

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.—*Con.*

| | *Chairman.* | *Secretary.* |
|---|---|---|
| 1895–96 | C. S. N. Hallberg. | Jas. H. Beal. |
| 1896–97 | " " | " " |
| 1897–98 | Jas. H. Beal. | H. Gordon Webster. |
| 1898–99 | A. B. Lyons. | C. B. Lowe. |
| 1899–00 | C. B. Lowe. | J. A. Koch. |
| 1900–01 | " " | " " |
| 1901–02 | E. G. Eberle. | J. W. T. Knox. |
| 1902–03 | J. W. T. Knox. | Harry B. Mason. |
| 1903–04 | Harry B. Mason. | Wm. L. Cliffe. |

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

| | *Chairman.* | *Secretary.* |
|---|---|---|
| 1900–01 | Henry P. Hynson. | F. W. E. Stedem. |
| 1901–02 | F. W. E. Stedem. | Wm. Kaemmerer. |
| 1902–03 | Geo. M. Beringer. | Wm. H. Burke. |
| 1903–04 | Wm. H. Burke. | E. A. Ruddiman. |

# AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President in compliance with the following resolutions:

*Resolved*, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

*Resolved*, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

*Resolved*, That whilst it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

| | | |
|---|---|---|
| *Arkansas*, | John B. Bond, Main and Fifth streets, | Little Rock. |
| | William L. Dewoody, | Pine Bluff. |
| *California*, | William T. Wenzell, 1998 Ocean Boulevard, | San Francisco. |
| | George B. Flint, 1101 Broadway, | Oakland. |
| *Dist. of Columbia*, | Walter G. Duckett, 22d st. and Penna. ave., | Washington. |
| *Connecticut*, | John K. Williams, 391 Main street, | Hartford. |
| | Warren A. Spalding, 19 Church street, | New Haven. |
| *Delaware*, | Herbert K. Watson, 803 Market St., | Wilmington. |
| *Georgia*, | Robert H. Land, 812 Broad street, | Augusta. |
| | Thomas A. Cheatham, Mulberry & 3d Sts., | Macon. |
| | Sidney P. Watson, 137 Richardson street, | Atlanta. |
| *Idaho*, | David E. Smithson, | Emmett, Canyon Co. |
| *Illinois*, | C. S. N. Hallberg, 358 Dearborn St., | Chicago. |
| | Henry Biroth, 481 25th St., | Chicago. |
| *Indiana*, | Frank H. Carter, 772 Massachusetts avenue, | Indianapolis. |
| *Iowa*, | John W. Ballard, 106 West Second street, | Davenport. |
| | George H. Schafer, 713 Front street, | Fort Madison. |
| | Silas H. Moore, 525 Fourth street, | Sioux City. |
| *Kansas*, | George Leis, 747 Massachusetts street, | Lawrence. |
| *Kentucky*, | William H. Averill, 435 Main street, | Frankfort. |
| | C. Lewis Diehl, 1346 E. Broadway, | Louisville. |
| *Louisiana*, | Alexander K. Finlay, 124 Baronne street, | New Orleans. |
| *Maine*, | Noah S. Harlow, 4 Smith's Block, | Bangor. |
| | Edward A. Hay, Free and Middle sts., | Portland. |
| *Maryland*, | D. M. R. Culbreth, 1307 N. Calvert street, | Baltimore. |
| *Massachusetts*, | S. A. D. Sheppard, 1129 Washington street, | Boston. |

| | | |
|---|---|---|
| *Massachusetts*, | Joel S. Orne, 493 Main street, | Cambridgeport. |
| | B. Frank Stacey, Thompson Square, | Charlestown. |
| | Freeman H. Butler, 391 Middlesex street, | Lowell. |
| | James E. Blake, 64 North Second street, | New Bedford. |
| | Thomas B. Nichols, 178 Essex street, | Salem. |
| | Francis M. Harris, 814 Main street, | Worcester. |
| *Michigan*, | Ottmar Eberbach, 12 South Main street, | Ann Arbor. |
| | James Vernor, 235 Woodward avenue, | Detroit. |
| *Minnesota*, | Wm. A. Frost, cor. Selby & Western aves., | St. Paul. |
| *Mississippi*, | Joseph W. Eckford, Commerce street, | Aberdeen. |
| *Missouri*, | James M. Good, 2348 Olive street, | St. Louis. |
| | George Eyssell, 1036 Union ave., | Kansas City. |
| *Nebraska*, | Autumn V. Pease, | Fairbury. |
| *New Hampshire*, | Andrew P. Preston, 2 Congress Block, | Portsmouth. |
| *New Jersey*, | Wm. M. Oliver, 132 Broad street, | Elizabeth. |
| | Hermann Klussmann, 110 First st., | Hoboken. |
| | Maxwell Abernethy, 188 Newark avenue, | Jersey City. |
| | Clarence P. Smith, 861 Broad street, | Newark. |
| *New York*, | Charles H. Gaus, 202 Washington avenue, | Albany. |
| | Rudolf C. Werner, 2592 Atlantic ave., | Brooklyn. |
| | Charles O. Rano, 1872 Niagara street, | Buffalo. |
| | William L. Du Bois, 281 Main street, | Catskill. |
| | John Hepburn, 103 Main street, | Flushing. |
| | Harvey G. Goodale, P. O. Box 29, | Jamaica. |
| | James T. King, Main and South streets, | Middletown. |
| | John McKesson, Jr., 91 Fulton street, | New York. |
| | Charles F. Fish, 348 Broadway, | Saratoga. |
| | Charles W. Snow, 214 Warren street, | Syracuse. |
| | William Blaikie, 202 Genesee street, | Utica. |
| *North Carolina*, | William Simpson, 101 Fayetteville street, | Raleigh. |
| | John H. Hardin, 124 South Front street, | Wilmington. |
| *Ohio*, | J. U. Lloyd, Court and Plum streets, | Cincinnati. |
| | George L. Hechler, 1099 Broadway, | Cleveland. |
| | Charles Huston, 47 South High street, | Columbus. |
| | Thomas J. Casper, 41 East Main street, | Springfield. |
| *Oregon*, | Louis Blumauer, Fourth and Morrison streets, | Portland. |
| *Pennsylvania*, | Jacob A. Miller, Second and Chestnut streets, | Harrisburg. |
| | Joseph L. Lemberger, 5 North Ninth street, | Lebanon. |
| | Richard M. Shoemaker, Fourth and Race streets, | Philadelphia. |
| | Philip M. Ziegler, 526 Penn street, | Reading. |
| | Edward A. Cornell, Fourth and Pine streets, | Williamsport. |
| *Tennessee*, | Jas. S. Robinson, Second and Madison streets, | Memphis. |
| *Texas*, | Geo. J. F. Schmitt, 507 W. Commerce street, | San Antonio. |
| *Virginia*, | T. Roberts Baker, Lester & Ash streets, | Richmond. |
| *Washington*, | Henry E. Holmes, | Seattle. |
| *Wisconsin*, | Edward Kremers, | Madison. |
| | John R. Drake, 365 East Water street, | Milwaukee. |
| *Prov. Nova Scotia*, | Francis C. Simson, Pentagon Bldg., | Halifax. |
| *Prov. Ontario*, | John A. Clark, E. King street, | Hamilton. |
| *Prov. Quebec*, | Henry R. Gray, 122 St. Lawrence Main street, | Montreal. |

# THE PERMANENT FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are three permanent Funds at the present time, all of which are invested in Massachusetts State bonds, in the name of the Treasurer of the American Pharmaceutical Association, and kept in the custody of the Chairman of the Council.

## THE LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named, a revised Constitution was reported by a committee, and, after consideration, adopted (see Proceedings 1856, pp. 12, 14, 27 and 79). Article II., Section 7 (afterwards Section 8), contained the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members, and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings 1870, pp. 87–96), and this, with a few slight amendments adopted in 1896 and 1900, is in force at the present time, containing the following:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, *the interest of which for any current year only may be used by the Association for its expenses.*"

Chapter VI., Article 5, of the By-Laws adopted the same year, reads as follows:

"Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and again in 1896 and changed to Article IV., Chapter VIII. As now in force, it reads as follows:

"Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, or after twenty-five years $30, or after thirty years $20, or after thirty-five years $10, also any member who shall have paid to the Treasurer annual dues for thirty-seven years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (page 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one

(until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings 1879, page 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, page 52) and again in 1896 (Proceedings, page 17) so as to apply also to those who have been members for over twenty years (see Chapter VII., Article 4 of By-Laws). Under this clause the life membership (new style) of the present roll is eighty-eight, as published in the Proceedings.

The Treasurer's report for 1880 (page 524) states the life membership fund to be $75, for 1881 (p. 513) $613, for 1882 (p. 608) $685, for 1883 (p. 436) $904.38, and for 1884 (p. 524) $944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that $316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund and be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147), it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of $3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471), the Association ordered again a transfer to the same Fund of $4,000.

Since 1887 the annual reports of the Chairman of the Council give the number of each bond of the Government securities in which the Life Membership Fund is invested. By vote of the Association, the name of this Fund was changed to the William Procter Jr. Fund on September 15, 1902. The report of the chairman of the Council on the invested funds of the Association, published on page 79 of the present volume, shows that on July 1st, 1903, the value of the William Procter Jr. Fund was $14,014.02 (face value of securities only given), *of which sum the interest for any current year only may be used by the Association for its expenses.*

## THE EBERT FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars, to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated *for conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determined merit, for the preparation of chemical or pharmacal products: the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; *provided*, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, page 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize*.

The Ebert Prize was awarded for the year 1874 to Chas. L. Mitchell; for 1877, to Fred. B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897 to Albert B. Prescott and Jas. W. T. Knox; for 1898 to Virgil Coblentz; for 1899 to Henry Kraemer; for 1900 to Edward Kremers and Oswald Schreiner; for 1902 to J. O. Schlotterbeck and H. C. Watkins; and for 1903 to Fred. B. Power.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to $683.43. Since 1887 the

reports of the Chairman of the Council specify the securities in which this fund is invested. On July 1st, 1903 (Proceedings, p. 79), its reported value was $879.22 (face value of securities only given). The *annual interest must be applied to a prize for an original investigation* meeting the requirements stated above.

## THE CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left, which by subsequent collections made in Philadelphia was increased to $525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees, to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund *to aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526 528), and adopted the name *Centennial Fund.*

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings 1880, p. 553), when $582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII. (Proceedings 1881, pp. 190, 549). Members have not availed themselves of this Fund to the extent contemplated at its foundation; for the amounts paid out have been only $7.50 to Robt. B. Warder for material used for investigations reported in 1885; $96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings 1889, page 16); and $32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892, $50 to the same investigator in 1893, and $50 again to the same investigator in 1894. In 1896 the sum of $22.33 was paid to the Committee on Indicators for material used in their investigations.

The original sum of $1107.81 ($525+$582.81) had increased in 1883 to $1232.76. Since 1887 the securities in which the Fund is invested are specified in the reports of the Chairman of the Council; the reported value was $1888.65 (face value of securities only given) on July 1, 1903 (see Proceedings, p. 79). *The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science.*

## THE GENERAL FUND.

In October, 1891 (see Proceedings 1892, page 13), the Council instructed the Treasurer to draw from the cash on deposit a sufficient sum and purchase therewith three bonds, one thousand dollars each, the same to be such bonds as shall be approved by the Finance Committee, said bonds to be registered in the name of the Treasurer of the American Pharmaceutical Association, and placed in the custody of the Chairman of the Council.

The investment was made in bonds of the American Security and Trust Company at Washington, D. C., for the sum of $3021.62 (see Proceedings 1892, pages 27 and 28). On July 1, 1897, the above bonds were redeemed, and six (6) 4 per cent. bonds of the same company, each for $500.00, taken at par and accrued interest.

At the Richmond meeting in 1900, the Chairman of the Council and the Treasurer were instructed to sell the bonds belonging to the General Fund and to place $1000.00 of the proceeds in the treasury and the balance in the Life-Membership Fund (see Proceedings, 1900, p. 18).

Two of the bonds belonging to this Fund were sold February 23, 1901 for $1012.56, leaving four bonds, each for $500.00, on hand July 1, 1901 (see Proceedings 1901, p. 99).

The remaining four bonds were called in by the American Security and Trust Company of Washington, D. C., and the cash received therefor turned over to the Treasurer on August 6, 1902 (see Proceedings, 1902, p. 652).

## PRIZES.

The resolutions adopted August 15, 1893 (see page 16, Proc. 1893) were amended September 1, 1898 (see page 98, Proc. 1898) to read as follows:

*Resolved*, That if worthy papers be presented, the Association award annually three prizes for the three most valuable papers, aggregating the sum of $100.00, and apportioned as follows: $50.00 for the first, $30.00 for the second, and $20.00 for the third prize.

*Resolved*, That a Committee of three be annually appointed by the President of the Association, their duty to be, first, to decide if one or more of the papers presented are worthy of a prize, and second, to decide upon the relative merits of such papers as are deemed worthy.

*Resolved*, That nothing in these resolutions shall be so construed at any time as to prevent the writer of the Ebert Prize paper from also receiving one of the Association Prizes for said paper.

The following resolutions were adopted September 1, 1898 (see page 98, Proc. 1898).

*Resolved*, That a prize be established to be known as the "Hermann Hager Memorial Prize," and of the value of $50.00. That in bestowing said prize, preference shall be given to contributions on pharmaceutical science or art, as distinguished from those on allied branches, though it shall not be confined to such. That said prize shall be awarded only when, in the opinion of the Committee on General Prizes, a contribution shall be deemed worthy of the award.

*Resolved*, That a prize be established to be known as the "John M. Maisch Prize," of the value of $50.00. Said prize to be awarded for research work in pharmacognosy only, on the recommendation of the Committee on General Prizes.

*Resolved*, That no one of the general Association prizes shall be awarded to the writer of a paper for which either the Hermann Hager Prize or the John M. Maisch Prize has been given.

For names of members of this Committee see page v.

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# PREFATORY NOTICE.

At the forty-second annual meeting of the Association, held at Asheville, N. C., the Council determined that the distribution of the printed Minutes, together with the papers read at the meeting, in advance of the bound volume of the Proceedings, which plan had been in operation since 1891, should be discontinued. This action of Council was approved by the Association at large at the General Session held September 8, 1894.

With the view of securing for the Proceedings as wide a distribution as possible, and to enable members to complete their sets at very low figures, the Council, at the forty-third annual meeting held at Denver, Colo., decided that the price of the Proceedings for 1890 and all previous years be reduced to one-half of that heretofore published. The Association at the General Session held on August 20, 1895, approved the action of Council, and the Committee on Publication offer the different issues at the following rates:

| | PAPER COVER. | BOUND CLOTH |
|---|---|---|
| 1851, 1852, 1853, 1854, 1855 ..... each | $ .13 | $ |
| 1857 ..... | .20 | .25 |
| 1858, 1864, 1865 ..... " | .38 | |
| 1858, 1860, 1862, 1863, 1864, 1865 ..... " | | .50 |
| 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873 ..... " | .50 | .75 |
| 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883..... " | 1.25 | 1.50 |
| 1884, 1885, 1886, 1887 ..... " | 1.75 | 2.00 |
| 1888, 1889, 1890 ..... " | 2.50 | 2.75 |
| 1891, 1892, 1893 ..... " | 5.00 | 5.50 |
| 1894 ..... " | 6.00 | 6.50 |
| 1895 ..... " | 5.50 | 6.00 |
| 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903 ..... " | 5.00 | 5.50 |

The reduced prices on all volumes published prior to 1891 do not include free delivery.

IN SETS (EXCLUSIVE OF THE POSTAGE OR EXPRESS CHARGES).

For any two or three volumes a discount of 10 per cent. on the above prices.

For any four to eight volumes a discount of 20 per cent. on the above prices.

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For any twenty-three to thirty-two volumes a discount of 50 per cent. on the above prices.

For any more than thirty-two volumes a discount of 60 per cent. on the above prices.

1854, 1856 and 1859 are out of print; none published in 1861.

Beginning with the first issue, in 1851, the actual cost of partial or complete sets—bound in cloth as far as on hand—will be as follows:

| To and Including | Number of Vols. | Price by Single Vols. | Price the Set Net. |
|---|---|---|---|
| 1855 | 5 | $0 65 | $0 52 |
| 1857 | 6 | 0 90 | 0 72 |
| 1858 | 7 | 1 40 | 1 12 |
| 1860 | 8 | 1 90 | 1 52 |
| 1862 | 9 | 2 40 | 1 68 |
| 1863 | 10 | 2 90 | 2 03 |
| 1864 | 11 | 3 40 | 2 38 |
| 1865 | 12 | 3 90 | 2 63 |
| 1866 | 13 | 4 65 | 3 26 |
| 1867 | 14 | 5 40 | 3 78 |
| 1868 | 15 | 6 15 | 4 31 |
| 1869 | 16 | 6 90 | 4 14 |
| 1870 | 17 | 7 65 | 4 59 |
| 1871 | 18 | 8 40 | 5 04 |
| 1872 | 19 | 9 15 | 5 49 |
| 1873 | 20 | 9 90 | 5 94 |
| 1874 | 21 | $11 40 | $6 84 |
| 1875 | 22 | 12 90 | 7 74 |
| 1876 | 23 | 14 40 | 7 20 |
| 1877 | 24 | 15 90 | 7 95 |
| 1878 | 25 | 17 40 | 8 70 |
| 1879 | 26 | 18 90 | 9 45 |
| 1880 | 27 | 20 40 | 10 20 |
| 1881 | 28 | 21 90 | 10 95 |
| 1882 | 29 | 23 40 | 11 70 |
| 1883 | 30 | 24 90 | 12 45 |
| 1884 | 31 | 26 90 | 13 45 |
| 1885 | 32 | 28 90 | 14 45 |
| 1886 | 33 | 30 90 | 12 36 |
| 1887 | 34 | 32 90 | 13 16 |
| 1888 | 35 | 35 65 | 14 26 |
| 1889 | 36 | 38 40 | 15 36 |
| 1890 | 37 | $41 15 | $16 46 |
| 1891 | 38 | 46 65 | 18 66 |
| 1892 | 39 | 52 15 | 20 86 |
| 1893 | 40 | 57 65 | 23 06 |
| 1894 | 41 | 64 15 | 25 66 |
| 1895 | 42 | 70 15 | 28 06 |
| 1896 | 43 | 75 65 | 30 26 |
| 1897 | 44 | 81 15 | 32 46 |
| 1898 | 45 | 86 65 | 34 66 |
| 1899 | 46 | 92 15 | 36 86 |
| 1900 | 47 | 97 65 | 39 06 |
| 1901 | 48 | 103 15 | 41 26 |
| 1902 | 49 | 108 47 | 43 38 |
| 1903 | 50 | 113 97 | 45 58 |

Orders for Proceedings should be sent to the General Secretary, 109 Aisquith street, Baltimore, Md.

The gold badge of the Association may be procured from the General Secretary on receipt of $2.


Blank forms of application and recommendations for membership may be obtained from the General Secretary or from the Committee on Membership; when properly filled up they should be sent to the Secretary of the Committee on Membership, Henry M. Whelpley, 2342 Albion Place, St. Louis, Mo., at least one week before the meeting.

The fifty-second annual meeting of the Association will convene at Kansas City, Mo., on the first Monday (5th day) of September, 1904, at 3 o'clock, p. m.

# MINUTES

OF THE

# FIFTY-FIRST ANNUAL MEETING.

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The Fifty-first Annual Meeting of the American Pharmaceutical Association was held at Mackinac Island, Mich., August 3–10, 1903. Mackinac Island is situated at the stragetic point where the waters of the great lakes Superior, Huron and Michigan meet, and the old white-walled fort, that crowns the summit of the hill not far from the steamer landing, commands the town and harbor, and was for many years in commission for garrison purposes. The island is picturesque and beautiful in a high degree, and has much of historic interest and Indian legend to commend it to the visitor. The Association had its headquarters at the Grand Hotel, an imposing structure after the Colonial style, located upon a plateau at the western end of the village, and all its sessions were held there. The attendance was excellent, considering the fact that the meeting-place was on the northern limits of the country, and far removed from the great population centers, and a very encouraging feature was the large number of new members that joined the Association, some two hundred in all.

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## First Session—Monday Afternoon, August 3, 1903.

The first general session was called to order in the Casino of the Grand Hotel, at 3 : 20 p. m., by the President, George F. Payne, of Atlanta, Ga., who said :

*Fellow Members of the American Pharmaceutical Association, and Ladies and Gentlemen Present :*

I shall now call to order the first session of the Fifty-first Annual Meeting of the American Pharmaceutical Association, and I wish to present to you Dr. J. R. Bailey, a citizen of Mackinac Island, and one of the oldest druggists of the State of Michigan, who desires to greet you with some words of welcome to this historic spot.

Dr. Bailey was received with applause as he arose and said :

*Mr. President, Members of this Association, your Better Halves, and our Distinguished Guests:*

We meet here, to-day, from all parts of our vast empire ruled by the people, and with us are the representatives of a border empire, who speak the same language, have the same laws, and with whom we are bound with the interchanging commerce and ties of blood and friendship that cannot be severed.

These straits were the hunting-grounds and abode of a fast-disappearing race. On these shores the soldiers of three great nations have proudly marched, and their flags, French, British and Unistars, triumphantly waved. Here battles have been fought with savage and foreign foes. Now, your fort is dismantled, not a single sentinel on the ramparts, its quarters tenanted by civilians, and nothing but the *Flag*, the emblem of our sovereignty left. The vessels of two great powers, twice in deadly strife, plow the deep, and daily arrive and depart from our wharves; and the commerce of these straits is more than thrice that of the famous Suez Canal.

This little Island of Mackinac, during the season of navigation, is one of the greatest passenger ports on the chain of lakes. No waterway in the world is as important as the Straits of Michili-Mackinac, and yet our harbor is without breakwaters, the ancient fort without soldiers, this commercial highway without fortification or a single gun for protection.

If under a French and British regimé, and with the United States, up to 1895, the possession of this island and its fortification has been deemed so necessary, why should a continuance of its occupation be considered useless? A strategic point, once selected, on any commercial highway, must, so long as there is any necessity for an army and navy, for local defence, always remain. More vessels of every class, under our flag and that of Great Britain, with a greater tonnage and larger value, annually pass through these straits, to say nothing of the ferries, than in any channels of the known world.

Assuming there is no danger from British subjects, because disputes between their nation and ours are settled by arbitration, that reason is not conclusive; both parties are interested. Suppose there should arise an insurrection, riot or rebellion, or a band of robbers invade these straits in an armed vessel, and take and hold this position for two or three days, interrupt navigation and stop the railway ferries? They could destroy floating property and lives, levy contributions and interrupt connections that would cost the government more than it would to hold the fort a hundred years.

We now willingly surrender these keys to the American Pharmaceutical Association. By their magic touch the arched portals of the fort will open and reveal the paths, roads and boulevards of the Fairy Island, the birthplace of the Great Manitou and the spirits whom the Indians delighted to worship.

My friends, in the name of the City of Mackinac Island, and of the Mackinac Island State Park Commission, you are welcome! [Applause.]

The President requested Mr. Joseph P. Remington, of Philadelphia, to respond on behalf of the older members of the Association to the hearty words of welcome just spoken, and Mr. Remington said:

Dr. J. R. Bailey: I have been asked by our President to respond to the words of welcome with which you have favored us. It is the habit of our Association to alternate our places of meeting, so that all sections of our great country may be visited. Last year our Jubilee Meeting was held in the city of Philadelphia—a spot crowded with historical recollections and associated in so many minds with the bell which rang out, on the 4th of July, 1776, the glad message which proclaimed "liberty throughout the world and to all the inhabitants thereof." And the wisdom of our committee, who decided to

meet this year in Mackinac, has been more than justified, for again in this beautiful spot do we find thousands of historical associations.

But the contrast is great. Instead of these associations being connected with political and civil liberty, in a city which at that time was inhabited largely by Quakers, those which we find here are connected with the wild, romantic and stirring events of war and conquest. A few of us in the East are accustomed to think of this part of the country as having been lately settled, and are apt to forget that it was as early as 1634 when Jean Nicolet, the French explorer, discovered this island. How appropriate was the French-Indian name of "Michilimackinac," the home of the giant fairies of the "Michsaw-gyegan," now Michigan! What a wonderful strategic point this beautiful island was, commanding, as it does, the narrow waters between the two greatest lakes—Superior and Huron!

Those of us who have come hither on the water, and have spent days in threading our way among thousands of islands clothed with verdure, and have gazed upon the beautiful forests and mountains, and have looked down into the depths of clear water and seen every tree and plant on the shores mirrored on its surface, have been uplifted by the spectacle, and have no longer wondered that those who come here and breathe this air of freedom, and "look through nature up to nature's God," realize that no American has fully lived until he has seen Mackinac.

Dr. Bailey, in the name of the American Pharmaceutical Association, I thank you for the privilege that has been afforded us, and you may rest assured that we will all cheerfully accept your welcome, and that we will carry away with us to our distant homes memories of this charming spot which will never be effaced. [Applause.]

The Chair next called on Mr. O. W. Bethea, of the State of Mississippi, to respond to the address of welcome on behalf of the younger members of the Association, and Mr. Bethea spoke as follows:

*Mr. President, Ladies and Gentlemen:*

It was a characteristic kindness on the part of our distinguished President to make it so well understood that I am representing the younger element, and barely tottering on the threshold of this great work. We have not brows that are proof against the crimson tide as we feel for the first time the gaze of this assembly. And as I view for the first time the faces of those whose names have since my pharmaceutical infancy been synonyms of professional excellence, I feel myself to be a mere child in an august assembly of grown-up folks. I feel that the old post in my wareroom showing a scratch six feet above the floor is a truer disciple of Ananias than I am of Galen. But in the due course of events it will devolve upon us to receive the mantle as it falls from the shoulders of you who now so ably wear it; and while we appreciate the fact that you have in a measure followed in the footsteps of those leading lights who went before, yet each able worker has served to broaden the way and make more firm the foundation; and we know that as the grave responsibilities devolve upon us, as you return one by one from the field, that we have but to continue to maintain the high ideals and uphold the noble purposes that have characterized this Association for more than half a century.

May I express the belief, yea, give the promise, that whatever we may lack in power shall at least be atoned for by enthusiasm. I am sure that I voice the sentiments of the vast majority of beginners when I say that we already love this old Association. To be with you is, indeed, the realization of a long-cherished dream. As the haunts of our ancestors seem hallowed, even so the halls of this great parent body. Here have been fought and won the battles that have enabled us to breathe higher and purer professional atmosphere, and from here have emanated that host of minor battles welding together in brotherly love the army of fellow-workers all over this great commonwealth.

There is a time-honored custom still adhered to by many of the gentlemen of the old school in the Palmetto State to meet the approaching guest at the foot of the steps. Dr. Bailey would meet him at the end of the avenue. In reply to your cordial address, sir, Prof. Remington has voiced to you the appreciation of the older members present. Many of them have grown gray in participating in the pleasures attendant on these meetings, and I beg to leave it to you, sir, how many times you would have to multiply his graceful remarks to make them cover the needs of those of us who are just learning to sip the brimming cup of pleasure held out in these great gatherings, and I assure you, sir, that when we return to our labors with the pill-tile and spatula, we will reflect with ever-increasing pleasure on your gracious welcome, on all the glories of historic old Mackinac Island, and on the whole-souled, open-hearted reception that we have received from the older members of the American Pharmaceutical Association. [Applause.]

The Chair said there were delegates present from several different organizations, and two or three departments of the government, and he would first call on Mr. Frederick T. Gordon, of the United States Navy, to address the Association as the representative of that department of the government service, and introduced Mr. Gordon as one occupying the position of pharmacist in the navy through the energy and hard work of the American Pharmaceutical Association. [Applause.]

Mr. Gordon said:

*Mr. President and Fellow Members:*

I have the honor to occupy a position here to-day that I think is quite noteworthy in our annals. This is the first time the Navy has ever sent a pharmacist as a delegate to this Association—though it has named a physician as delegate—and this action was largely due to the kind offices of the Surgeon General in the matter. At first, he was not inclined to do this, but he actively interested himself to have the Secretary name a pharmacist for the place when it was put before him in the right light. The Assistant Surgeon General was also a good friend in this cause. It was the original intention of the Surgeon General to have a doctor sent here, but when I suggested to him that at the next meeting of the American Medical Association he send a druggist as a delegate, he saw the point, and sent a pharmacist here instead. [Applause.] I would like to say to the members of the Association that the comparatively favorable position that the pharmacist in the naval service occupies is largely due to the American Pharmaceutical Association, and particularly to Dr. Payne, for whom every pharmacist in the navy has a very warm spot in his heart. [Applause.] There are some few things we would like to get, and Surgeon General Rixey, of the Navy, has requested me to ask the assistance of the Association in his efforts in this direction. In the first place, we want more pharmacists. We have now twenty-five, and we want twenty-five more. Five years ago, when the first twenty-five were appointed, it was an experiment—so much so that our warrants were signed by the Secretary of the Navy, instead of by the President, so they might be revoked at any time. Now, Dr. Rixey wants legislation at this session of Congress for twenty-five more pharmacists, and we want to raise the status of pharmacists to that of other warrant officers, and then we will get the benefit of any legislation affecting warrant officers generally. The other warrant officers are endeavoring to secure the passage of an act allowing promotion to a higher grade after six years' service, and we want the benefit of the same measure if it becomes a law. As it is now, we must have special legislation when we get anything, and we simply want to be put on the same footing as other warrant officers. So on that point particularly the pharmacists of the Navy respectfully ask the Association for its aid. I thank you, gentlemen, for your kindness. [Applause.]

THE PRESIDENT: We also have credentials here for two delegates from the Public Health and Marine Hospital Service, Mr. A. M. Roehrig and Mr. Henry Gahn. If either of these gentlemen is present, we would like to hear from him.

Mr. Gahn arose in his seat and said:

*Mr. President and Gentlemen:* I am not prepared to say anything, and I am a poor talker, so all I have to say is, we thank Dr. Payne and the Association for the good they have done us.

Mr. Roehrig was called for and said:

*Mr. President and Fellow Members of the American Pharmaceutical Association, Ladies and Friends:*

You have heard so much about the government pharmacist in recent years that no doubt you have wondered what sort of a looking object he was, and now that you see the animal uncaged, I presume you will see that he is not unlike other pharmacists. But I should perhaps modify that suggestion, in view of an experience Mr. Gahn and I had at Niagara Falls the other day. We had occasion to go into the place of business of a brother pharmacist, and I said to him: "I presume you will give the usual discount to a brother pharmacist?" He said, "Are you a pharmacist? You don't look like it." I was with my colleague who has just preceded me, as I have said, and the Niagara Falls man said: "You fellows look too healthy to be pharmacists." I said, "We are government pharmacists." He replied, "Oh, that makes a difference!" [Laughter.] Pharmacy has made wonderful progress during the past decade, but our National Government has been somewhat tardy in recognizing the fact. A few years ago this Association, as you know, undertook to educate the government, with the view to having proper recognition by the government of our profession. But few of you realized what a stupendous task lay before you. There are few of you who have the slightest conception of what a precedent means in a case like this. To overcome this obstacle was something more than a bargain. The Supreme Court—the highest judicial tribunal of our country, if not in the world—will not render a decision until it has consulted all the precedents in a case. Congress may make laws, amend and repeal them, but a precedent once established seems to remain forever. But this Association, in spite of the odds against it, started in, under the guidance of our good friend Dr. Payne, to better our condition, and we all owe the greatest debt of gratitude to him for what he has done for us. Every pharmacist in the government service should get on his bended knees and pray most fervently for our good Dr. Payne. [Applause.] Now, we have a gentleman in Washington of extremely modest manner, who seems to have a very strenuous article of that commodity called "back-bone." I refer to Surgeon-General Wyman, of the United States Public Health and Marine Hospital Service. After a personal acquaintance with General Wyman for more than twenty years, and after serving under him before he became Surgeon-General, I am prepared to say he has always been a friend of the pharmacists, and since he has been Surgeon-General he has given us a practical demonstration of it. He has done more for our cause than any other man in the government service. He braved precedent by recommending to the President of the United States that the odious title of "hospital steward" be abolished, and that the more agreeable one of "pharmacist" be adopted, and it was done at once, and at the meeting in Philadelphia last year we had the pleasure of informing you that we were then pharmacists in fact as well as in name, and since that time new regulations have been promulgated which provide for a very substantial increase in compensation and emoluments. When your President last year invited the different heads of medical departments to send repre-

resentatives to the semi-centennial meeting in Philadelphia, in commemoration of your fiftieth anniversary, Surgeon-General Wyman was the only one to respond by sending a delegate, and I had the distinguished honor of attending in that capacity. I mention these facts simply that you may know who have been our friends in this matter. I wish to say, if you will permit me, that our chief has a very great responsibility. He has the supervision of some twenty-five marine hospitals, and many more quarantine stations, situated in different parts of our country, and several hundred relief stations covering the Atlantic and Pacific coasts, the Great Lakes, the Gulf of Mexico and interior rivers, Alaska, the Hawaiian Islands, the Philippines and Porto Rico, and is in constant touch, day and night, by telegraph, with his officers and employees in this vast army of workers. He is a man of wonderful executive ability and superior generalship. It is not many years since this country was periodically visited by pestilence and contagion, but since this faithful public officer has had control of the national health service, yellow fever and kindred epidemics are practically unknown. Mr. President, the American Pharmaceutical Association has done a wonderful work in the advancement of the profession of pharmacy. Your meetings in the past have been fruitful of much good, and I can do no more at this meeting than to wish that it may be as successful and as fruitful as those of of the past, and surely I can wish you nothing better. Gentlemen, I thank you for your attention. [Great applause.]

The Chair called upon Mr. Lyman F. Kebler, of Washington City, to speak as a pharmaceutical chemist representing by appointment, the Drug Laboratory in the Department of Agriculture, and that gentleman spoke as follows, being received with applause as he came forward :

*Mr. President :* I must confess that I am taken completely by surprise. I did not come here to say a word relative to the work we are doing in connection with the Department of Agriculture. The pharmacists who have just spoken have had the advantage of having this Association back of them; they hold their positions to a large extent through the work done by this Association. But my position has grown up by proxy, so to speak. It was one that was needed for a great many years, and the man that has largely done the work is Dr. Wiley. He foresaw that a thing of this kind was coming, and he presented the matter in a very attractive form, such as he can easily do, and it has taken solid footing. Dr. Wiley told me to say to his friends here that the only reason he was not with you at this time was because he had to attend another convention. I want to say that the Drug Laboratory connected with the Bureau of Chemistry is now well under way and in good condition for work. When I assumed my position the first of March the Drug Laboratory had not assumed any form. Congress had established the position and appropriated money for its maintenance, and also to do the work required, but, curiously enough, neglected to provide money for the equipment of a Laboratory. That was the peculiar condition I was confronted with when I got there. Dr. Wiley, however, had funds available that he could use for the equipment of a laboratory, and as I came away the tables were ready for work and the cases were ready, and by the time I get back the Laboratory will be fully established to do work well. But we need the coöperation of this Association, as I told one of the members this morning. There are a great many things that we ought to do. There are a great many things we see there that you don't see here or anywhere else. The recent act of Congress gives us an opportunity to keep out of this country a large number of adulterated products that have been coming in heretofore, but in some cases it is hard to class them as either drugs or food. One of the difficulties we have to contend with is that a great many chemicals come to this country that are frauds, and while we can expose them in a great many

cases, the manufacturers are quick to make the proper adjustment, and we are unable to keep them out by any present law we have, and that will have to come in the future if we are to keep them out. To illustrate my meaning, I will cite the case of some beeswax that came to us from the southern portion of the country, which was imported from Mexico. The sample was adulterated with starch, grossly adulterated, and yet we could not take hold of it because we were afraid it would not be ruled to be a drug at all. In England beeswax is only classed as a drug under certain conditions. This beeswax was adulterated with 33 per cent. of starch. But I will not speak further on this subject now, as I will read a paper on this line at one of the sessions of the Scientific Section. We need the coöperation of this Association, and we want you to work with us hand in hand and shoulder to shoulder. We need work, especially by way of legislation from the patent point of view. Those of you acquainted with the phenacetin question know what I mean. We are endeavoring to get material together so as to present the matter in a practical and effective manner to Congress—to the committee in charge of that work—to bring about legislation to prevent future patents of that character being granted. We say, allow a patent on the process only, and not the product. This is one of the things we are doing; and I can say, also, that the Bureau of Plant Industry is working with us in connection with this work. They are in a position to identify the product or substance, while we can identify its chemistry. Mr. President, I thank you for this opportunity of saying a few words in regard to the new Laboratory and its work. [Applause.]

THE PRESIDENT: Mr. Kebler prefaced his remarks by saying that his own position was not due to the efforts of the American Pharmaceutical Association, like those in some of the other departments of the government service. I do not think any of us thought that. But what we are proud to know is that the American Pharmaceutical Association, by its work for professional pharmacy, has developed such men as Lyman F. Kebler, and that the United States Government has come to our Association to secure its Chief for the Drug Laboratory in the Department of Agriculture. That is what we feel proud of, peculiarly proud of, Mr. Kebler.

MR. KEBLER: I thank you, Mr. President.

The Chair stated that the Association was in possession of credentials for delegates from the American Medical Association to this meeting, and said if any of the delegates were present, the Association would be glad to hear from them at this time.

Mr. Hallberg suggested that Dr. Meyer, chairman of the delegation, was unfortunate enough at the last moment to have an affliction of the eye that would probably keep him away, but that he thought somebody else would probably be present later on to represent the Medical Association.

The Chair then called upon Mr. Thomas P. Cook, as the accredited representative of the National Wholesale Druggists' Association present, to say a few words on behalf of that body. Mr. Cook was heartily applauded as he arose to speak, and also at the close of his brief remarks. He said:

*Mr. President, Ladies and Gentlemen:* I had hoped that the chairman of my delegation would be here to-day to address you, but in his absence allow me to extend to you the cordial greetings of the National Wholesale Druggists' Association, and to wish most earnestly that this meeting may be pleasant and profitable to you all.

The Chair invited the representatives present from the National Asso-

ciation of Retail Druggists to address the convention, and Mr. Lewis C. Hopp, Chairman of the delegation, spoke as follows:

*Mr. President, Ladies and Gentlemen:*

As Chairman of the delegation from the National Association of Retail Druggists, I present you the hearty greetings of the National Association of Retail Druggists. The National Association of Retail Druggists is the youngest, liveliest and healthiest association of druggists in the United States to-day. [Applause.] It is an association that started out on a plan of education. It is an association that is going to be of a great deal of assistance to the American Pharmaceutical Association, which is *the* greatest of all pharmaceutical associations, barring none in the world. [Applause.] The National Association of Retail Druggists in the last year has educated the druggists to the point where they will get more money for their goods—get pay for the work they do, where they have been getting nothing for it for practically the last fifteen years. They are bringing about a concurrent feeling amongst the druggists, so that the very atmosphere of this country is permeated with associationism. It makes no difference what town or hamlet you go into, you will find members of the National Association of Retail Druggists. Last year we had 250 local organizations to come into the association, and I think this year we will have almost 200. This is going to help American pharmacy. That is going to put our profession on a plane fully as high as any medical association. When the delegates to the meeting of the National Association of Retail Druggists gathered at Cleveland last fall from the north, east, south and west, many did not believe the association would be in existence by this time because of certain dissensions and jealousies that had unfortunately grown up. They gathered there with disaffection in their hearts, many of them, and the outlook was not encouraging. But at the very opening of the association the Ohio druggists stepped in and said, "Gentlemen, at this meeting we are going to run things, and if there is anything of this sort going on we want it referred to the Ohio druggists, and we will put it away where it will never be seen again." The result was we had the best meeting, the best fraternal feeling, we have ever had, and we stand to-day with over 700 affiliated local associations composing our membership, and I think in the next four or five years, with a little practical work on the part of the American Pharmaceutical Association, we will have two or three thousand such local associations in our membership. Gentlemen, on behalf of the National Association of Retail Druggists, I wish you all a very refreshing meeting. It goes without saying that it will be profitable, for there never was a meeting of the American Pharmaceutical Association that was not profitable. Gentlemen, I thank you. [Great applause.]

The President then called First Vice-President Cliffe to the chair while he read his address, as follows:

*Fellow Members of the American Pharmaceutical Association, and Ladies and Gentlemen Present:*

My able and industrious predecessor in his annual address last year presented us with a most appropriate offering for our Golden Jubilee Meeting. His study of the history of the American Pharmaceutical Association for the past fifty years brought together in a most graphic and delightful manner many valuable facts. His capable address will be a paper of constant reference for long years to come, and when our centennial year is reached, this splendid mirror of the progress of the American Pharmaceutical Association for its first fifty years will be held aloft and studied as a precious document of deep interest, and the name of Henry M. Whelpley will not be forgotten. The history of the past was most capably handled, nor was the present neglected in the memorable address of last year. This is the first year of our second semi-centennial. The future is before us,

and we have a great record to make if the progress of our second fifty years is to equal the first half of a century which has just passed. The present is with us and the future beckons us on. Let us gird up our loins and be up and doing. The times are richer with opportunities than ever before. Such early pioneers as Procter, Squibb, Rice and others witnessed the fiercest conflicts; their battles won, they leave behind them to those who follow the tremendous responsibility of holding the ground already won, and with such valuable vantage points to press forward to ever-increasing victories. Upon each and all of us devolves the great responsibility of doing our best. You cannot know what is your best until by the most untiring effort and perseverance the dross has been beaten away from the pure gold and your ability and character stand revealed.

For the suggestions I have to make to-day I request your careful consideration, that they may have the benefit of your good judgment and be adopted, cast aside, or improved, as may seem best to you for our beloved Association.

It is a pleasure to note the very general good-fellowship, courtesy and consideration always shown by the members of this Association for each other. In as large and able a body as this there must constantly be striking differences of opinion. The remarkable absence of friction in our meetings must be a source of pleasure to us all. But few men, if any, achieve prominence without making bitter enemies. Even purity, sincerity and goodness without any other apparent causes for provocation sometimes arouse cruel foes. It is difficult to sound the human heart and learn the true cause of some of its bitterest antagonisms, but whatever these personal animosities may be, the Association is to be congratulated on the fact that year after year its members meet together and transact its business in the most delightfully pleasant and harmonious manner. This is probably largely due to the fact that the Association is chiefly made up of successful men, and successful men of affairs are nearly always those who are considerate of the opinions and feelings of others. I trust that this good-heartedness will also bless our present meeting and that when we separate and go to our several homes we may all carry with us a most delightful memory of the incidents of this meeting and of those who participated in it.

### DELEGATES FROM OTHER ORGANIZATIONS.

We have with us to-day delegates from many different organizations. To each and all we extend a hearty welcome and thank them for the honor of their company. We appreciate their presence at our deliberations and request their participation in our enjoyments.

For the first time we have present with us delegates from the pharmacists of the United States Navy, and a delegate from the chemists of the Department of Agriculture of the United States. There were delegates present last year for the first time from the pharmacists of the Public Health and Marine Hospital Service of the United States. This year they are again with us. Such public and growing recognition of pharmacy by the Government, is a source of gratification to us all.

### OUR DELEGATES TO STATE, TERRITORIAL AND PROVINCIAL ASSOCIATIONS, AND TO THE OTHER PHARMACISTS OF THEIR RESPECTIVE SECTIONS.

Adopting the suggestion of my predecessor, I appointed delegates for the year from the American Pharmaceutical Association to the various State, Territorial and Provincial Associations of the United States and Canada, requesting, in addition, that they also act as our delegates to *all* the pharmacists of their respective States, Territories and Provinces. Many of these gentlemen have been quite active in behalf of the Association, and have done excellent work. Their names are as follows:

| | | |
|---|---|---|
| Alabama | L. S. Bingham | Montgomery. |
| Arizona | Harry Brisley | Prescott. |
| Arkansas | L. K. Snodgrass | Little Rock. |

| | | |
|---|---|---|
| California | W. M. Searby | San Francisco. |
| Colorado | C. M. Ford | Denver. |
| Connecticut | C. A. Rapelye | Hartford. |
| Delaware | H. K. Watson | Wilmington. |
| District of Columbia | W. H. Bradbury | Washington. |
| Florida | E. Berger | Tampa. |
| Georgia | T. A. Cheatham | Macon. |
| Idaho | D. E. Smithson | Emmett. |
| Illinois | P. G. Schuh | Cairo. |
| Indiana | H. E. Glick | Lafayette. |
| Iowa | Fletcher Howard | Des Moines. |
| Kansas | L. E. Sayre | Lawrence. |
| Kentucky | J. W. Gayle | Frankfort. |
| Louisiana | F. C. Godbold | New Orleans. |
| Maine | E. A. Hay | Portland. |
| Maryland | D. R. Millard | Baltimore. |
| Massachusetts | J. F. Guerin | Worcester. |
| Michigan | Henry Heim | Saginaw. |
| Minnesota | W. A. Frost | St. Paul. |
| Mississippi | O. W. Bethea | Meridian. |
| Missouri | Paul L. Hess | Kansas City. |
| Montana | B. Rockefeller | Butte. |
| Nebraska | H. H. Barth | Lincoln. |
| Nevada | W. A. Brown | Winnemucca. |
| New Jersey | G. W. Parisen | Perth Amboy. |
| New Mexico | Geo. A. Morris | Fort Stanton. |
| New York | S. E. Jelliffe | New York. |
| North Carolina | P. W. Vaughan | Durham. |
| North Dakota | Herbert E. White | Jamestown. |
| Ohio | W. R. Ogier | Columbus. |
| Oklahoma | Francis M. Weaver | Oklahoma City. |
| Oregon | J. S. McNair | Ashland. |
| Pennsylvania | Jacob A. Miller | Harrisburg. |
| Rhode Island | A. B. Collins | Westerly. |
| South Carolina | Oscar E. Thomas | Columbia. |
| S. Dakota | David E. Jones | Watertown. |
| Tennessee | A. B. Rains | Columbia. |
| Texas | Eugene Eberle | Dallas. |
| Vermont | W. E. Terrill | Montpelier. |
| Virginia | R. H. M. Harrison | Richmond. |
| Washington | E. Bolink | Seattle. |
| W. Virginia | W. H. Williams | Wheeling. |
| Wisconsin | H. C. Schrank | Milwaukee. |
| Quebec | Henry Willis | Quebec. |
| Nova Scotia | F. C. Simson | Halifax. |
| New Brunswick | M. V. Paddock | St. John. |
| Manitoba | C. Flexon | Winnipeg. |

SPECIAL MEMBERSHIP COMMITTEES OF ONE.

During the year I wrote a personal letter to every member of the Association who was not already on one of the membership committees, and urged each one strongly to use his best endeavors to bring in one or more new members, as upon the new members

depended the very life and continuance of the Association. While some considered the letter as of a purely circular character, others did not, but took it as the direct appeal which was meant. That it should have found responsive heart-beats among so many is peculiarly gratifying. The many expressions of appreciation and congratulation received in regard to that letter well repaid me for my trouble and expense in sending out 1800 individual letters, as was actually done. Thirteen hundred went to members and 500 others went to personal acquaintances requesting them to join.

### INIMICAL LEGISLATION.

During the year much legislation antagonistic to the best interests of pharmacy has been attempted. Fortunately most of it has been defeated. Pharmacists should ever bear in mind the words of Curran: "Eternal vigilance is the price of liberty." Two of our members, A. E. Ebert and H. M. Whelpley, gave their time and brains freely to the pharmacists of a sister State in their efforts to defeat adverse legislation, both of them making considerable journeys for the purpose. Such cordial and ready good-heartedness and good-will endears such characters to us all.

It is much easier to defeat bad attempted legislation before it is enacted than it is to secure its repeal after its passage. It is of vital importance that the new bills of each Legislature should be scanned closely when they are first introduced, that they may be properly met at the first, and thus save much time, annoyance and expense. It is very rare that the members of any Legislature desire to pass a bill which is unjust to pharmacists. They are nearly always ready to hear our side of the case, but the further a bill progresses toward its final passage, the more prestige it has secured; hence prompt action is nearly always desirable.

### SOME FEATURES OF THE RETAIL DRUG BUSINESS.

The minds of some men, no matter how old they become, are ever ready to keep up with the progress of the times and new ideas. The brains of others, when they advance beyond middle life, seem to reach a certain point where the mind is averse to new impressions and sensations and, living largely in the past, can see but little good in the present. The minds of the young, by a wise dispensation of nature, are ever hopeful and ready to do their best under the conditions around them, for they know no other. With the old there are strong memories and impressions of the past, which they can but compare with present conditions and frequently to the latter's disadvantage.

Some of our older men may sigh for the past, with its drugs powdered by hand, its laboriously hand-made mercurial ointment, hand-spread plasters, hand-made pills prepared from horn-like solid extracts, etc., but there are many others who rejoice in the convenience and rapidity of modern dispensing. Prices were higher for prescriptions in the older days, but think of the time and the manual labor consumed. A prescription that cost fifty cents years ago must be sold for twenty-five cents now. Yet there is a good profit in the twenty-five cent prescription, for it takes so little time to dispense it, and a half dozen or more can be put up in the time formerly taken for one. Our population has more than doubled in the past twenty years, and the times constitute an era of large sales and small profits, This feature has been carried to a sad excess in some directions, but fortunately it has been confined chiefly to the nostrums or so-called patent medicines. Their sale under our existing laws does not involve a knowledge of pharmacy. They are put up in ready-made packages, which the druggist hands over the counter, without the slightest claim as to any knowledge of their actual composition. The prestige of pharmacists skillfully used, largely aids the manufacturer in his successful advertising. Besides, many pharmacists advertise such goods at their own expense, and even appear in the daily papers as guaranteeing that these nostrums will cure disease. What kind of a crop can pharmacists reap from such methods, but "a harvest of barren regrets."

The sale of other men's nostrums is not a business to appeal very strongly to a competent pharmacist, either professionally or as a source of profit. There is a field of endeavor, however, whose splendid harvest stands ripe for the reaper, and one which, although so often advised in which to labor, the average pharmacist views askance, as requiring too much effort, too much brains and too much capital. This is not true. The bald and barren cliff which looks so smooth and sheer in the distance has many footholds and convenient projections to aid one in climbing upward, which become visible when you determinedly come close enough to make the upward effort. Still more so the fields which seem so smooth and slippery from afar give splendid foothold when you bravely step forward. The times are constantly changing; the practice of pharmacy is changing, the practice of medicine is changing, and to those who first note such tendencies to change and take advantage of them, the richest harvests usually fall. Time was when the pharmacist was called the doctor's cook, and the barber flaunted his bloody rag wrapped around a pole as a sign that he was also a surgeon. The pharmacist and the surgeon have both become professional men. The surgeon has invaded the realm of the practice of medicine, and now partly eschewing drugs makes marvelous cures by the use of the knife. The medical practitioner is pleased with the alkaloids and other active principles furnished by the pharmaceutical chemist in such concentrated form; he is delighted with the elegant pharmaceuticals or palatable ready-made prescriptions of the pharmacist; he is charmed with the convenience and portability of the tablet triturate combinations of the manufacturing pharmacists; he has almost discarded the long and clumsy prescriptions of the past as the pharmacist has discarded hand-made mercurial ointment, pills and plasters. Many of the medical colleges now teach that the days of the shot-gun prescriptions are past and that it is a day of direct and potent simples, for instance:

R. Syrup. Hypophos. Comp. N. F..

Or Syrupus Hyposphosphitum Compositus. This seems simple, but when that formula is actually in working shape for the pharmacist it calls for six mineral bases, two mineral acids, one organic acid, one alkaloid and one crude vegetable drug.

The enterprising pharmacist is already in the holy of holies of prescription writing and devising. The enterprising manufacturers with business acuteness employ the very best pharmacists and pharmaceutical chemists, and with their many ready-made specialties or prescriptions are reaping well-deserved golden harvests. These men should not be envied or decried for their ability and energy, but congratulated upon showing the splendid opportunities for high-grade professional pharmacists.

In many communities the opportunities of the local pharmatists are peculiarly good for pushing their own specialties. Personally acquainted with the local doctors and being on the ground they have a decided advantage over the manufacturers. The efforts of some individuals in this direction have been partially successful.

Show the physicians what you can offer them that is desirable. You can devise elegant and palatable preparations containing those drugs most prescribed or needed in your neighborhood. The doctors will be glad to use them. They do not generally claim to be chemists or pharmacists, and will quickly respond to your efforts, if tact and good judgment be used.

One man can do much, but in large communities if the major portion of the pharmacists get together and co-operate in such work the possibilities are great. If a number of pharmacists are in concert, and each aids to the best of his ability in furnishing some good formulas or suitable names to the good cause, several excellent combinations can be put out; if pushed faithfully by all, they will be very generally used. The names can be registered that they may be properly controlled. Preparations can be made separately in the different stores, or all made under the direction of a special committee elected for this supervision. Many physicians would be ready to aid in such a movement along ethical lines.

### THE N. A. R. D.

The work of the National Association of Retail Druggists is still being pushed with energy and perseverance. In all such large movements, covering a great territory and many people, results cannot be accomplished suddenly or quickly. Those who least realize and understand the tremendous expense and labor necessary to cover this great country are naturally those who are the most ready to grumble at what they consider slowness of results. Such dissatisfaction causes a lack of co-operation, and thus aids in retarding the work. Continued, thorough, active and energetic work and unity of effort *can and will* accomplish the results desired. Vast good has been done by the organization in a large number of places; outside of its excellent work in securing living prices, the good fellowship and mutual understanding promoted among local pharmacists has been beneficial in many ways. The N. A. R. D. has already repaid the pharmacists of the United States many fold for the expense of its support. Some sections have not been benefited as much as others in prices, but a subtle influence for good is abroad which has done much to be commended, besides controlling prices.

The Miles contract plan appears to be proving a success. While not as convenient as some jobbers desire, it will grow more and more popular with the retail pharmacists if it continues to stand the test of time and trial. The pharmacists of the country appreciate the independence and courage of the Miles people.

### A MODEL POISON LAW.

Nearly every State, territory and province in the United States and Canada has a poison law of some kind. These poison laws are not all homogeneous in character, and it is desirable that they agree with each other as far as possible. A model poison law properly drawn up and sent to the governor of each State, with the request that he incorporate it in his next message, or at least call attention to it and give the reasons for its adoption, would probably bring good results. The recent passage of a number of cocaine enactments of various character, the more general knowledge of pernicious drug habits, and the evident necessity of more uniformity in the requirements as to the manner in which poison should be labeled, are among the excellent reasons which can be presented for the adoption of a uniform poison law. The matter of labeling alone has become a serious one to the manufacturers on account of the varying requirements of different States. Only a few weeks ago a pharmacist was heavily fined for selling a poison labeled correctly according to the law of the State from which he bought the drug, but not according to the law of his own State.

### ALCOHOL AS A NECESSITY AND THE LIQUOR LAWS.

The subject of the legal control of the sale of liquids containing alcohol is one which interests pharmacists very seriously in most communities, as nearly every commonwealth and municipal corporation has laws or ordinances controlling the sale of such fluids in various ways. Next to water, alcohol is the most important solvent used in pharmacy. Its solvent properties are such as to enable it to dissolve a great range of medicinal substances, such as resins, volatile oils, alkaloids and other active principles which are insoluble in water. Its own solubility in water, freedom from unpleasant taste, lack of odor and absence of medicinal action in ordinary doses, and also its cheapness, all combine to make it indispensible to the pharmacist.

The growing feeling in favor of prohibition throughout the country is also felt in the drug business, and many druggists insist on having nothing to do with "liquor." This is very commendable, but the solid fact remains that ordinary dispensing cannot be carried on under present conditions in the practice of medicine without the use of alcohol. Liquor laws and ordinances are aimed at *alcohol*. Some cities have ordinances which prohibit the use of alcohol in any form, even including prescriptions, tinctures, fluid extracts, etc.,

unless the liquor license is paid. It is quite common for pharmacists who do not sell wine, whiskey, brandy, malt extract or plain alcohol, or alcohol in any form except as tinctures, fluid extracts, colognes, etc., to claim that they do not sell alcohol in any form, and thus escape the tax. Others more tender in conscience and more severe in their construction of the English language, pay the license fee. Many of these laws and ordinances were devised in ignorance of the true part played by alcohol in the practice of pharmacy. It is a hardship to the pharmacist who sells no alcoholic liquids which can possibly be used as beverages to be forced to pay such a tax or to violate the letter of the law and to be actually liable to punishment.

There are a number of very different acts in the various States regulating the sale of alcoholic liquids, and in some States the "local option" laws in the different counties of the same State are almost diametrically opposed to each other. In the meshes of such a tangled net even the most care-taking pharmacist is likely to be caught when there is no general State law which clearly gives the manner in which the pharmacist can carry on his legitimate use of alcohol in the preparation of pharmaceuticals and the dispensing of prescriptions. In some few States liberal concessions have been given to druggists; in other States, even where liquor is freely sold, the business of the pharmacist has been seriously interfered with by his being placed on the same plane as the saloon keeper. Pharmacists in some of these sections have felt forced to keep liquors as a business proposition to enable them to pay the tax, when they would have much preferred not to have done so if they could have carried on their regular drug business without paying the tax and not violating the law at the same time.

A well-thought-out model law to regulate the sale of alcohol and alcoholic liquids by druggists would be an excellent guide as to desirable legislation for the pharmacists of the United States, and could no doubt be passed in a number of our States and save much annoyance, anxiety and loss caused by present conditions. The dispensing of such substances as brandy, whiskey and extract of malt might or might not be permitted on bona fide physicians' prescriptions. If permitted, violations of such legislation by misrepresentation should be punished by a penalty inflicted upon the person making the misrepresentation, and not upon the innocent pharmacist or physician. The legal and straightforward use of alcohol in his business is a matter of serious import to the pharmacist. We may shirk it and cast it aside as unworthy, but taken in the proper aspect it deserves our careful thought and consideration, that reputable pharmacy may stand upon its proper plane, and not be forced to appear in an unjust position. That a reputable pharmacist should be arrested for selling a U. S. P. tincture of ginger because it contained alcohol, and be forced to employ a lawyer and defend himself, is a hardship, and unjustly causes a loss of prestige and reputation. An explanation as to the absolute necessity of alcohol in the legitimate drug business certainly seems needed in some quarters. Such explanation, however, will not be effective unless followed by a properly worded Act which will meet actual conditions properly. Legislation so evidently just and fair, we believe, can readily be secured and is much desired by many of our best pharmacists.

### REPORT ON THE PROGRESS OF PHARMACY.

This splendid year-book on the progress of pharmacy is one of the most valuable contributions which comes to our libraries. Where work is so well done as is this of C. Lewis Diehl, it is with hesitation that one dares suggest further improvement, but in so valuable a work, and one to which it is so often desirable to refer, the need of a good index is most striking. While the work is arranged in a classified manner, which is much to be commended, a good index would make the book much more serviceable. An extra supply of these index pages would make fine documents with which to induce practical druggists to become members.

A few weeks ago a member wrote a friend and urged him to join the Association.

The friend replied that he could not see his way clear to do so at present, as he could not attend the meetings. In a few days he wrote the member, requesting the formula for a certain compound. The formula was sent, free of charge. A short while afterwards the member was again appealed to by the same party for the formula for another preparation. He sent it, and wrote that he had gotten both of the formulæ out of the Report on the Progress of Pharmacy of the A. Ph. A., and that when he devised such formulæ he charged from $25.00 to $100.00 for them, and that his friend must consider that the A. Ph. A. Proceedings had already been worth at least $50.00 to him, although he still hesitated to become a member. The next mail brought an application for membership from his friend, and a letter acknowledging that the argument was most convincing.

### THE PROPOSED NATIONAL FOOD AND HEALTH BUREAU.

The committee of the American Pharmaceutical Association appointed to serve with that of the American Medical Association, to investigate the proposed National Food and Health Bureau, will lay their report before you at the present meeting.

The committee has given much thought and study to this subject, which well deserves our careful attention, friendly discussion and best judgment. Whatever direction the matter may take or whatever disposal may be made of it, the Association is to be congratulated upon the cordial desire of the American Medical Association to act in friendly unison with us in the joint control of this national bureau, and the ready willingness of the Bureau of Food and Drug Control of the United States Government to co-operate with the American Pharmaceutical Association in the work. The opportunity for us to more strongly influence the character of all such work throughout the United States is a grand one and not to be lightly cast aside. We trust that the report of our able committee will show that the bureau is a practical possibility.

### THE CULTIVATION OF PLANTS FOR THEIR MEDICINAL PROPERTIES AND FOR THEIR ESSENTIAL OILS.

A glance over the map of the world and the location of the United States and Canada must immediately impress one that their resources should be more than equal to those of the whole European continent. When one turns to actual facts it will be seen that our developed mineral and chemical wealth is already marvelous, and no country has such a surplus of wheat, corn, meat and cotton, or, in shorter words, food and clothing. With a country which spreads from east to west over one-fourth of the distance around the globe and from the frozen Arctic Ocean on the north to the tropical waters of the Gulf of Mexico on the south, it would seem that there are but few plants which are desirable but that we possess a climate suitable for them. While much has been done with edible fruits and something with plants bearing essential oils, there is a vast field yet untouched. Cotton is an introduced plant, and only a few generations ago the English government seized a small shipment of it leaving the American colonies on the ground that it could not have been raised in this country.

It would seem that such plants as the jasmine, tuberose, rose-geranium, rose, magnolia and violet could be raised profitably in some sections. Magnolia grandiflora grows wild in the southern states. With our splendid American perfume industry means should be taken to cultivate the perfume-bearing plants in suitable localities throughout the continent. The potato-like canaigre, so rich in tannic acid and valuable for tanning leather, grows finely in Texas. The plant which furnishes the "Buhach" insect powder is already cultivated in California and, to judge by the bountiful way in which dog-fennel and similar compositæ grow upon the eastern slope of our continent, it would seem that Pyrethrum cinerariaefolium, P. carneum and P. roseum might be all cultivated with success.

Tea grows well from the seed and in the open air in Georgia, and it is now cultivated successfully in South Carolina and brings $1.00 a pound for all put upon the market.

The Cassava, which is so rich in starch, can be made to yield splendid crops in several southern states.

The camphor tree and sisal plant grow well in Florida, and I have collected handsome pieces of cork from grand, old Spanish cork oaks growing in Georgia.

The culture of aloes, opium, senna and many other drugs are well worthy of further trial, as there are sections which appear adapted to them. Various oil-bearing plants are already being cultivated in a number of the Middle and Western States and also in the Southern sections. We are calling attention, however, to what is not done, which it would seem can be done successfully.

### THE NATIONAL FORMULARY AND DOMESTIC REMEDIES.

Our excellent National Formulary is steadily growing in well-deserved popularity. The more perfectly it meets the needs of the American pharmacists the more popular it will become. There is always room for improvement in all human enterprises, and excellent as is the present work, it can only be kept up to its present condition by constant addition, elimination and improvement. It is somewhat unfortunate that it is not practical to add after each preparation a terse description of its medicinal uses and advantages that the enterprising pharmacist might utilize such descriptions to interest physicians and promote the use of these formulæ.

To some it may not appear ethical to suggest the publication of formulæ for a line of standard domestic remedies.

Our constitution says one of our aims shall be "To encourage manufacture in the several departments of the drug business." In this great day of so-called patents and their increasing sale in country stores, department stores, etc., it would seem but proper for pharmacists to put up a line of domestic remedies of their own manufacture and push their own goods instead of cut-rate patents, which are fattening on the sales of competing druggists, while the unfortunate druggists are finding the volume of their profits growing smaller and smaller.

The preparations suggested could be added to the National Formulary as a second section devoted to domestic remedies, as the Formulary is not large, or the work could be printed separately. This work would standardize the formulæ used and be of great value to many phrmacists. A good, catchy name would be an advantage for each formula.

### PROFESSIONAL PHARMACY.

Pharmacy is steadily advancing as a profession. Three departments of our United States government have sent pharmaceutical delegates to our present meeting. Last year one department sent delegates for the first time.

Certainly professional pharmacy is not the sale of the so-called patent nostrums. A pharmaceutical education is not required to do this, but to prepare one's own domestic remedies and pharmaceuticals, requires pharmaceutical knowledge. The dispensing of prescriptions also requires a knowledge of pharmacy. The devising of prescriptions, however, is already in the hands of manufacturing pharmacists. A few retail pharmacists devise and push pharmaceuticals of their own and reap a good reward. The prescriptions of the leading manufacturers are frequently the combinations of prominent physicians or devised for them, and very often gain a foothold on the reputation of such physicians. After these combinations are made into tablets or finished liquids, they can be dispensed by any one. The recent discussion in regard to pharmacists being properly paid for professional work, if kept up and properly acted upon, with a steady effort to properly instruct the public and the physicians, may do much in some directions, but it is the manufacturer, little and big, who is getting the best returns for professional pharmacy. The man who measures out, or counts out, the manufactured goods of another, is not exercising his pharmaceutical attainments. A large percentage of prescriptions are now handled in this way, yet

pharmacists do not attempt to handle their business so as to best meet these changed conditions, but grumble as not being paid as well for machine-made pills as for those made by hand. Opportunities for success are more numerous than ever, but not on the old lines. Pharmaceutical chemistry offers an inviting field for those who will stick to the work and become thoroughly competent. The pharmacist and physician are getting closer and closer together in the relation of chemist and physician, sanitarist and doctor. Not only is chemistry as relating to drugs becoming more and more important, but also chemistry as it relates to the human body, its various parts, bones and tissues, secretions and excretions. The physician, as his work broadens and widens, leans more and more upon the educated pharmacist, wherever he finds an educated pharmacist who is capable.

Let us encourage and promote this growing reliance of the profession of medicine upon the modern pharmacist.

### INSURANCE AT LOWER RATES.

The matter of drug store insurance is worthy of our serious attention. The rates on drug stores and drug stocks have been steadily increasing instead of decreasing. The danger from fire in such places has certainly decreased very materially in recent years in retail drug stores. There are many substances of an inflammable character like turpentine, linseed oil, kerosene, etc., which were formerly kept in retail drug stores which are now not carried in some establishments, or where kept in stock, are kept in small quantities in tin cans, in which condition they are not likely to cause fires like the formerly-used barrels with faucets, which permitted dripping and leaking. The cans are also far easier to remove to places of safety than heavy barrels, and the small quantities are, of course, far less dangerous. The pharmacist is usually a man well versed in physical laws and knows almost by intuition the best way to handle a fire with the means at his command. We believe the insurance companies are almost prepared to admit the unfairness of the rates on buildings occupied by drug stores. While there is greatly decreased danger of fires in drug stores, which alone should diminish the rates, the claim is made that a drug stock is one of the worst kinds of stocks for the companies to have losses upon, as damaged drugs are always claimed to be worthless, and the bottled goods are subject to tremendous breakage from handling. The diminished risk of fire should alone certainly decrease drug-stock and drug-store insurance, yet the practice has been to gradually increase it. The pharmacists in several States have already taken up this matter in various ways with some success. If the American Pharmaceutical Association will present the matter in a clear, practical way to the different insurance associations and companies, coming from so representative a source it will be given careful attention, and if urgently pressed will no doubt cause the saving of many thousands of dollars annually to the druggists of this continent.

### THE RIGHT OF THE AMERICAN CITIZEN TO RE-SELL DRUGS HONESTLY BOUGHT ABROAD AND ON WHICH HE HAS PAID THE UNITED STATES DUTIES.

The laws of the United States very properly give certain protection to the ideas, devices or inventions of her people by granting patents to protect them in their ownership of such ideas, devices or inventions. These laws are said to go further than this and give privileges to foreigners over our own people which said foreigners are not given by their own governments over their own citizens. The strained construction of our laws which causes them to grant such special privileges to foreigners we do not believe is in the spirit in which such laws were passed. The American government is a "government of the people, by the people, for the people," and any law or set of laws which can be twisted so as to force the ill and suffering of the United States to pay one dollar an ounce for drugs made by foreigners, for which the balance of the world only pays eight cents per ounce, is not in sympathy with our institutions. A law which prevents a citizen of

the United States from going or sending abroad and buying a drug or drugs in the open markets of the world and entering them at our custom houses, and paying the duty on them and re selling them, is certainly non-American. That foreign houses should avail themselves of the law which gives them the sole right to manufacture and sell a certain drug in America and so construe it as to also give them the right to charge twelve times as much for such protected drugs as they do in other civilized countries, is but natural, if our courts and law-makers permit it, as it resolves itself into the business proposition with them of getting it if they can.

If the American Pharmaceutical Association would take up this matter and draw up a proper bill, its passage could be secured in Congress and thus remedy a great injustice to our people. A bill drawn up briefly and to the point would remedy the matter. It would be unwise to burden it with other phases of the subject of patents on drugs and chemicals. Make the issue clear and to the point and we will win. Draw up the bill so as to give the American citizen the right (which I believe he already has, but we want it clearly established) to buy in the markets of the world any drug, chemical or medicinal preparation of standard quality and pay the United States duty upon the same and re-sell it in this country. Some foreigners now claim the exclusive right to make and sell certain patented drugs in this country. They manufacture them in Europe and claim that an American purchaser in Europe has no right to buy any of the goods made for sale in European countries, pay the United States duty and re-sell them in this country. It would seem that if they sold to an American citizen in Europe they had sold to one of the Sovereigns of the United States and when said citizen had paid his own government duty he had as full right to re-sell the drug as would another American citizen who chanced to buy from the firm while in this country.

Neither France, England nor Germany permit such discriminations against their citizens, no drug being permitted to be sold at a higher price than in the country of its manufacture, with freight and duty added.

This is a matter of serious importance, and should be taken up actively in our next Congress.

### IS IT DESIRABLE FOR THE ASSOCIATION TO PUBLISH A JOURNAL?

During the meeting at Philadelphia last year the matter of the publication of a drug journal by the American Pharmaceutical Association was suggested. It is a suggestion which I am sure we would all be very glad to adopt if it would broaden out and strengthen our beloved Association. I would like to recommend the adoption of this suggestion if I could bring myself to feel confident that it would be of material benefit.

Our present annual report on the progress of pharmacy is rich with the gathered harvest of pharmaceutical advancement for the year. Dividing this into twelve monthly installments, of course, would not bring many new members, but the personal references and catchy notes and suggestions of a journal would certainly bring us in some additions to our membership. But would an organ of the Association bring us in any more new members than our present splendid American Pharmaceutical Press? Every pharmaceutical journal now in existence in the United States and in Canada is ever ready to cordially and earnestly do anything in its power for the American Pharmaceutical Association, and is not only *ever ready* to do anything in its power, but is *ever doing* all that it can do for us. The present Pharmaceutical Press goes to every pharmacist in the United States and Canada. It reaches some 50,000 drug stores. This is a great influence, and we would dislike to see its hearty enthusiasm lessened in the slightest degree.

I am sure we could enormously increase our membership if we could devise some way for the members to attend the meetings economically. If we could increase the membership we could get much cheaper railroad rates, but it is the cheap railroad rates we need first and then we can get the large membership, and with the large membership we can

have a successful paper. I sent letters of inquiry to the editor of the Journal of the Pharmaceutical Society of Great Britain and to other prominent British pharmaceutical editors in regard to the success of the Journal of the Pharmaceutical Society of Great Britain, stating that we were discussing in a friendly way the feasibility of a journal for our American Pharmaceutical Association. The replies were either non-committal or discouraging. The Pharmaceutical Society of Great Britain has the same dues as our own Association, $5.00, or one guinea. By the Pharmacy Act of 1868 the Pharmaceutical Society of Great Britain was changed from a purely voluntary body, and has statutory rights and an income from examination fees of $50,000 annually. With the same rights as the Pharmaceutical Society of Great Britain we would have an income from examination fees of about $100,000. Under similar conditions to those of the British Society we could certainly issue a splendid journal, and we would probably have about 12,000 members paying us some $60,000 annually as dues. Conditions are so different that we would not be fair to ourselves to judge our chances of success in the journalistic field by those of the British Society. I made these inquiries honestly seeking more light on the subject, but it would seem that our best field for further investigation will be along the line of American Associations which have made successes or failures in publishing journals in past years. Our efficient auxiliary committee on membership and its capable chairman, J. W. T. Knox, gave us some valuable information on this subject, and we regret that they did not go more fully into the matter. I am not thoroughly convinced that the American Pharmaceutical Association cannot carry out such a venture successfully. But we have been successful for 50 years, and it would be wise to feel somewhat more sure than we do before venturing upon such a field.

### UNITED STATES PHARMACOPŒIA.

The U. S. P. is now being rapidly gotten into shape for publication. The amount of detail and hard work which devolves upon each one of the Revision Committee is very large and the responsibility which devolves upon the chairman of each sub-committee is far, far greater, but the work and responsibility of the chairman of the whole Revision Committee is something tremendous. The universal courtesy and tact which Joseph P. Remington has shown in this arduous work, his apropos and excellent suggestions in regard to doubtful points and his general ability and untiring faithfulness has brought to him a still higher admiration and regard from his co-workers who have long ago learned to love and admire him.

### COLLEGES OF PHARMACY.

Our colleges of pharmacy are steadily increasing their facilities and giving better and better instruction in pharmacy and the allied sciences. The apprentice system has long since fallen into disuse and the later requirement of a few years' drug-store experience or a diploma in medicine or in pharmacy to entitle one to operate a drug store has given way to examinations by State Boards of Pharmacy, which require either a few years' drug-store experience or a diploma in pharmacy of all applicants before they are permitted to come up for examination. Some of the more progressive States are already considering the requirement of a diploma in pharmacy of all who come up for examination. During the transition stage which is now taking place, older pharmacists are frequently quoted as having made disparaging remarks in regard to graduates in pharmacy. Such statements are sometimes misquoted and are nearly always misunderstood. A competent pharmacist can but appreciate a thorough knowledge of the business in another; but when it is considered that there is a commercial training, as well as a scientific one necessary to make a well-rounded-out pharmacist, it is easy to understand and sympathize with some of these expressions. A college graduate may be well versed in pharmacy, chemistry and botany; he may be able to pass a good State Board examination; he may be a safe and competent prescriptionist, and his professional work may be first

class, yet he may make a failure as a drug clerk. Many proprietors have a business which requires an all-round man. Scientific pharmacy, chemistry and botany are only needed a comparatively small portion of the time, but the art of cleaning bottles properly, pasting labels correctly, filling bottles with judgment and *selling goods successfully*, are the chief part of the week's work. Good salesmen are not developed by college instruction, and proprietors are not justified in unkindly criticising college graduates for their shortcomings in this respect. Expert tradesmen are best developed by actual training in the shops. Colleges of Pharmacy and State Boards of Pharmacy are not devised for the development or examination of expert salesmen but of competent pharmacists. This fact is quite generally understood but is sometimes momentarily lost sight of in the heat of sudden exasperation.

State Boards of Pharmacy are now beginning to ask, "What constitutes a reputable college of pharmacy?" The subject is one of vast importance to the cause of pharmaceutical education. Good colleges of pharmacy should be properly recognized as such by the various State Boards of Pharmacy, by the Government service and by the public. The times are rich with precious opportunities for the colleges of pharmacy. Conservative action and cordial co-operation can do much for these institutions. Many new colleges of pharmacy are now being organized. An established code among those which have already been able to sustain themselves for ten or more years would be of value. Their very existence for ten years or more shows that they have established a certain degree of permanence and character.

Many of the State Boards of Pharmacy wish some fair means by which to decide what colleges they shall recognize as colleges of pharmacy. Some States already accept those recognized by the American Pharmaceutical Association. The only recognition the American Pharmaceutical Association now gives to colleges of pharmacy as institutions is the recognition of their delegates. This is a broad and liberal recognition extended to *all* colleges of pharmacy. The Public Health and Marine Hospital Service now requires all applicants for positions as pharmacists to be graduates in pharmacy. No restriction is laid upon the college further than that it shall be a reputable college of pharmacy, which is construed to be any institution of this kind which is not of disreputable character. The model pharmacy law, adopted as a guide by this Association, provides that all applicants for license to practice pharmacy shall be graduates in pharmacy before being permitted to take the State examinations. The colleges of pharmacy should get more in touch with each other and carefully study present conditions and opportunities, appoint hustling, active committees, and do all in their power to promote confidence among each other, that proper standards may be more accurately and more fully met. Co-operation is the order of the day. Of the enormous body of men who go into the drug business each year but a small percentage are graduates.

The harvest now ripening is a generous one. The reapers are not working in the splendid unison which is necessary for the best results for all.

The requirement of graduates of pharmacy in our departments of the public service of the United States is a long step forward toward better professional recognition. The times seem ready for good results from further sturdy work. Both the public and our medical brethren appear more ready to accord better professional recognition than ever before. In the strenuous life of most American pharmacists there is but little time or opportunity to teach the young clerks in the store. They are wanted to do a serious day's work from the start, and to be competent to do it successfully. These opportunities for co-operation, development and growth the colleges should not overlook or cast aside.

### TRAVELING MEN.

To the gentlemen whom we usually call drummers or commercial travelers I wish to extend a word of congratulation and good will. Their ready appreciation of new ideas

and kindness in helping others to profit by them is most commendable. They are ever bright and sparkling springs of knowledge. I wish to commend the attention of my brother pharmacists to these wide-awake disseminators of pharmaceutical information. You can gain many valuable facts from them which you will not find easy to obtain in other ways. I speak from personal experience, and wish to impress upon you that there is much to be obtained from the pharmaceutical evangelist by working him while he is working you.

### MORE INTEREST SHOULD BE TAKEN BY PHARMACISTS IN PUBLIC AFFAIRS.

The support of our government is the duty of us all. Every true American should feel deep within his heart the tremendous responsibility upon him. The drug business is one of infinite detail, and will consume every moment of your time if permitted to do so, but your duty to your God, your country, your family and to yourself demands that closer interest and attention should be given to public affairs. Throughout our broad country the legal fraternity lead in their attention to public matters, next comes the medical profession, and far, far down in the list will be found the pharmacists. There has been some improvement in this respect in the past few years. There is vast room for yet more when we consider the high standing and acquaintanceship of pharmacists in their respective towns and cities. We wish better recognition both by the public and our government. We can best secure it by taking more interest and part in public matters. There is one great subject which seriously effects not only pharmacists, but *all citizens of small or moderate means*, and which can best be remedied by the cordial, united action of all such citizens, and that is the unjust and unfair system or lack of system practiced in nearly all communities of assessing property less and less below its true value as the actual value of the property rises or the greater and greater the wealth of the owner. Compare the valuation of property in your community of similar value to your own and yet owned by some very wealthy party, and if you do not already appreciate the yearly loss to yourself by disproportionate valuations you will quickly realize it. The argument is used that rich people will not invest in a community if not encouraged to do, but will go elsewhere. The argument is not sound, for if not given such non-American concessions by any community, there would be no encouragement to go elsewhere, and besides it is not true that one person making, for instance, two hundred thousand dollars per year is worth to a community more than two hundred persons making one thousand dollars per year. The former will probably spend fifty thousand dollars in that community and invest the remainder in bonds and other securities of distant corporations. The two hundred men will spend the whole two hundred thousand dollars in the community. The two hundred active, successful workers will do far more for the community and by all things Americans are entitled to, and should have equal proportionate valuation of their property. I speak of the subject, as I feel it to be a serious matter with nearly every pharmacist, as the great majority are not above moderate circumstances, and it is a matter which all of you have sufficient influence and ability as leaders to materially improve if you will make the effort.

### SYNTHETIC ALCOHOL.

I have felt impelled to call your attention to a number of matters of business importance in the field of pharmacy. Pharmacy involves commerce as well as science, and it is proper that both should be considered. The two go hand in hand, and the pharmaceutical chemist is ever ready to avail himself of new discoveries and apply them to practical uses that the dispensing pharmacist and the medical practitioner may profit thereby. The subject of low-priced alcohol is one which is ever of considerable interest on account of its great importance as a solvent of medicinal principles. As a fuel and as an ingredient of liniments and varnishes, alcohol of a low price is particularly desired. These wants have been met in some degree by the use of wood alcohol. If it were not for the

internal revenue tax on ethylic alcohol, it could be sold much cheaper than the wood alcohol. Wood alcohol is not a safe substance to use internally and it is not at all certain that it is safe to be used externally, and as a fuel it is not as pleasant to use as the grain alcohol. Since the recent introduction of alcohol motors, cheap grain alcohol has become more wanted than ever before. The very unpleasant gasoline odor left behind by the passing automobile can be obviated by use of an alcohol motor. The present high cost of grain alcohol is largely due to the high revenue tax. Without the high internal revenue tax of $2.07 per gallon, alcohol could be readily sold for thirty cents per gallon, which is less than the price to which gasoline has recently climbed. Alcohol can no doubt be prepared for fuel use at a far lower price than this, as it is said to be produced in Germany from potatoes at a cost of twenty cents per gallon, and is probably produced in this country from corn at a cost fully as low. If alcohol for fuel use were to be permitted to be distilled free from tax, there could be a number of waste materials utilized for the purpose, such as the pumice from the beet-root sugar factories of the West, the waste from the sugar-cane mills of the South, and many other very cheap materials. Cheaper even than these sources of alcohol is the newly-devised French process of manufacturing alcohol without the use of any organic matter whatever. This is said to be done by first forming calcium carbide ($CaC_2$), by melting lime and coke dust together in the electric furnace. The calcium carbide treated with water yields acetylene gas ($CaC_2 + 2H_2O = C_2H_2 + Ca(OH)_2$.) Sufficient hydrogen is then added to produce ethylene ($C_2H_2 + H_2 = C_2H_4$) and by combining water with the ethylene alcohol is produced ($C_2H_4 + H_2O = C_2H_6O$). This synthetic process is said to produce alcohol at less than ten cents a gallon. If it can ever be gotten down this cheap, our legislators will probably compel automobiles to use alcohol motors and abolish gasoline as a public nuisance.

### POLONIUM AND RADIUM.

Two recently-discovered substances are now interesting the scientific world, and not only the scientific world is interested, but the general public also. To Madame Curie, of Paris, belongs the credit of separating a substance of unusual radio-activity from pitchblende, a black ore of Uranium, as far back as 1898. Believing this to be a new element she named it Polonium, after Poland, which is her native country. Her husband, Prof. Curie, of the Paris School of Physics and Industrial Chemistry, joined her in her investigations, and together they succeeded in obtaining another substance of 100,000 times more radio-activity than that of the Uranium compound with which Becquerel first discovered the rays which now bear his name. This new body, while described by Prof. and Madame Curie as radio-active bismuth, on account of being so closely allied to bismuth, is also called radium by them upon the supposition that it is a new element, as the lines of its spectrum do not coincide with those of any other known element. Pitchblende is said to contain less than one ten-millionth of one per cent. of radium. The positive statements made in regard to radium are most remarkable and, if true, which seems to be the case, will necessitate a change of some of our theories in regard to matter. It emits ions with a velocity of about 130,000 miles a second, which penetrate solids and attack the flesh. These corpuscles are many times smaller than atoms and are continuously given out in a mighty stream without loss of weight by the radium. The energy developed by the enormous velocity of these corpuscles is tremendous. It has been suggested that radium does no more in one way than the magnet does in another. They both develop energy without any apparent help. On account of its intense energy any substance brought into contact with radium, like the finger, for instance, is said to become radio-active in turn. M. Curie recently stated to the French Academy of Sciences that "radium possesses the property of continuously emitting heat without combustion, without chemical change, and without change of molecular structure after many months of continuous emission. It also maintains its own temperature at 15 degrees C.

above its surroundings." It is said that M. Curie states that it is a dangerous substance to handle; that he would not venture into an ordinary room where there were two pounds of it, as it would probably cause him the loss of his skin, his eyesight and his life. Further experiments are being carried on by M. Curie and others with this new substance, of which so much has been said, which we cannot accept as fully proven until more fully demonstrated. It is not at all likely, both on account of the price and of other reasons, that pharmacists will be soon selling radium foot-warmers to take the place of hot water bottles. Used in this way its effect would probably be even more trying than capsicum or chrysophanic acid. Prof. Becquerel has suffered for some weeks from a sore caused by the action of the rays emanating from a tube of radium chloride which he carried in his pocket. A case of cancer in Vienna is claimed to have been recently cured by the action of the rays from radium bromide, which is claimed to be the strongest radium salt in existence.

### CHEAPER CAMPHOR.

There has been lately discovered in China a large territory peculiarly well adapted to growing the camphor tree, and the Chinese are enthusiastically going into the business growing this crop. A company with large capital has recently been organized in the United States to manufacture camphor under the new synthetic process from our American oil of turpentine. There is, therefore, a prospect of cheaper camphor.

The following recommendations are submitted for your consideration:

### RECOMMENDATIONS.

1st. That the names of all committees to be appointed by the President for each year be arranged in a complete separate list by the General Secretary before the close of each annual meeting, and a copy of the same be given the incoming President, preferably at the close of the last general session or as soon thereafter as practical. The General Secretary is very familiar with the standing committees, and can have them written out in advance, with space between to insert any new committees which may be formed. This will prove a saving of time taken up in correspondence between the General Secretary and the new President, and will enable the President to arrange his committees with much more promptness and satisfaction to himself. A President only has a few months to serve, and such a full list would save much time which is now unnecessarily lost in looking up these matters.

2d. That the committees appointed by the President be printed together in the Proceedings and not mixed up with those of the Council, that the committees to be appointed by the President may be seen by him at a glance, and more easily studied and provided for.

3d. That the various professors of colleges of pharmacy and members of State Boards of Pharmacy present be requested to unite in a joint conference at some convenient time during our meeting for an interchange of ideas and views in regard to what should be: First. The generally adapted requirements of those who come before State Boards of Pharmacy for examination to secure license to practice pharmacy. Second. What should be the proper character of Board examinations? Third. What should really constitute a standard college of pharmacy?

4th. That the names of all those who have secured new members for the present meeting be published as a roll of honor, and the number of new members secured by each be given. The first name of indorsement on each application blank to be given credit for that new member.

5th. That an index to his report be prepared each year by the Reporter on the Progress of Pharmacy and attached to the work.

6th. That a committee of five be appointed by the President, to whom members of the

Association and other pharmacists may communicate any systematic disparagement of pharmacists which may come under observation, and any information at their command as to the source of such detrimental matter so that the members of this Association and all other pharmacists may know something of the animus of these scurrilous attacks upon our honorable calling.

7th. That the exhibit feature which was omitted at this meeting on account of the distance from any large city, be again resumed at the next meeting, as it is far too valuable in its instructive features to be discontinued.

8th. That a committee of ten or other convenient number be appointed to draft a model poison law along the lines suggested.

9th. That a committee of ten be appointed to draw up a preamble showing the absolute necessity for the use of alcohol in pharmaceutical preparations and in the dispensing of prescriptions, and whereas these conditions exist, that they also be instructed to draw up a model State act giving to pharmacists the right to sell and dispense liquids containing alcohol without paying a tax for so doing, under such conditions as will completely prevent the sale of any alcoholic medicinal preparation which can be be used as a beverage, except under such circumstances as shall establish that such use is not intended.

10th. That the work for a lower tax on alcohol be actively continued.

11th. That the name of the Auxiliary Committee on Membership be changed to that of General Committee on Membership. It being a very important independent committee the latter name seems more appropriate.

12th. That a committee be appointed to investigate the feasibility of publishing formulæ for domestic remedies.

IN CONCLUSION.

I have presented to your consideration to-day a number of matters which appear to me of serious practical importance. I have sought to be direct and clear in what is meant, and not to generalize. There are still other matters which need your considera tion, but the ones to which I have called your attention appear among the most important at present.

I thank you for your kind attention. I know that the best interests of pharmacy and of this Association are very near to your hearts. I have suggested several new committees to handle matters of importance. Good committee work adds to the interest of the members in the Association. We have much fine material for good committees. It is true many of the older members have had more of this kind of work than they would have preferred if left to their own inclinations. But there are many members, both old and new, that have not served on committees, and others who have served but little. I recognize their ability, and trust that these new committees will enable us to add some of their brains to those of the splendid sets of workers who have been always so steadily faithful.

We are to-day making part of the history of the American Pharmaceutical Association. The bright star of hope is leading us on. With less professional recognition than is accorded the pharmacist of any other civilized people, we have much for which to work. There is no easy road to success. Let us not stop or turn aside when obstacles confront us, but remember that the steady impact of the tiny drill will force a passage through the mightiest granite mountain.

The President's address was received with applause.

THE CHAIR: You have listened with considerable attention and care to the address of your President, embodying his thoughts and ideas in regard to our Association developed during the past year, and also the recommendations he has made, which will need con-

sideration at your hands. I would suggest that it is customary to ask for the appointment of a committee of three to consider the President's recommendations.

Mr. L. E. Sayre, of Kansas, made a motion accordingly, coupled with the request that the committee to be appointed make its report at the next session, but report at the end of this session upon the recommendation as to joint conference at some convenient time during the meeting between teachers in colleges of pharmacy and members of State Boards of Pharmacy present, so that they might arrange to get together if the recommendation was approved. Mr. George W. Voss seconded the motion, and it was put and carried. The Chair announced that he would appoint as a Committee on President's Address Messrs. Frank G. Ryan (Chairman), of Detroit; John F. Patton, of York, Pa., and J. W. Baird, of Boston. These gentlemen were requested to take up the work at once, and report later on at this session on the point indicated.

President Payne resumed the chair, and called for reports from the various standing and special committees, stating that such reports would be received now and be read at the next general session and acted on.

The Secretary then called for reports from the following committees:

*Committee on Transportation*—Chas. Caspari, Jr, Chairman.
*Committee on Revision of U. S. Pharmacopœia*—R. G. Eccles, Chairman.
*Committee on General Prizes*—H. H. Rusby, Chairman.
*Committee on National Legislation*—F. C. Henry, Chairman.
*Committee on National Formulary*—C. Lewis Diehl, Chairman.
*Auxiliary Committee on Membership*—Wm. Mittelbach, Chairman.
*Committee on Weights and Measures*—Frank G. Ryan, Chairman.
*Committee on Status of Pharmacists in Government Employ*—Geo. F. Payne, Chairman.
*Committee to Communicate with Carnegie Institute at Washington, D. C.*—C. A. Mayo, Chairman.
*Committee on William Procter Fund*—Jos. P. Remington, Chairman.
*Committee on Model Pharmacy Law*—Jas. H. Beal, Chairman.
*Delegates to American Medical Association*—C. S. N. Hallberg, Chairman.
*Delegates to National Wholesale Druggists' Association*—C. A. Mayo, Chairman.
*Delegates to National Retail Druggists' Association*—Geo. L. Hechler, Chairman.
*Committee to Present the Views of the A. Ph. A. on Character and Scope of Work of New Drug Laboratory*—A. E. Ebert, Chairman.

Mr. Ebert: Mr. President, the appointment of that committee, consisting of Mr. Lloyd, Mr. Kebler and myself, was made at a very late day, and at least Mr. Lloyd and myself hardly knew what the work of the committee was to be, and we have no report ready. We would suggest, however, that the committee be continued for another year, and then we will be in a condition to report something to the Association that will be of practical value, I think. The committee this year was without knowledge of the character of work intended by the United States Drug Laboratory, and so a report from us now would really be of no value. Therefore I move that the committee be continued for another year.

The motion was seconded by Mr. Mayo and carried.

The Chair called for the report of the Committee on Credentials at this point, and Mr. C. S. N. Hallberg, Chairman, read the following:

REPORT OF COMMITTEE ON CREDENTIALS.

*Mr. President and Members of the American Pharmaceutical Association:*

The Committee on Credentials beg to report that they have examined the credentials presented by delegates of the various organizations named below and find them correct:

*Colleges of Pharmacy*—Albany, Atlanta, Brooklyn, California, Chicago, Cleveland, Highland Park, Maryland, Massachusetts, National, New York, Philadelphia, Pittsburg and Saint Louis—14.

*Schools of Pharmacy*—Medico-Chirurgical College of Philadelphia; Northwestern University; Purdue University of Lafayette, Ind.; University of Iowa; University of Kansas; University of Michigan; University of Minnesota; University of Wisconsin and Vanderbilt University, Illinois Medical College of Chicago—10.

*State Pharmaceutical Associations*—Arkansas, Connecticut, Georgia, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, Oklahoma, Ohio, Pennsylvania, South Carolina, South Dakota, Texas and Wisconsin—24.

*Alumni Associations*—Philadelphia College of Pharmacy, St. Louis College of Pharmacy, Northwestern University School of Pharmacy—3.

*National Associations*—National Association of Retail Druggists, National Wholesale Druggists' Association, Woman's Pharmaceutical Association, U. S. Department of Agriculture, U. S. Naval Service, U. S. Public Health and Marine Hospital Service—6.

*Local Associations*—German Apothecaries' Society of the City of New York, Dauphin County, Pa. Pharmaceutical Association and Philadelphia Association of Retail Druggists—3.

C. S. N. HALLBERG, *Chairman*,
JNO. F. PATTON,
GEO. M. BERINGER.

The chair called on Mr. H. M. Whelpley, Secretary of the Council, for applications for membership in the Association recommended by that body, and Mr. Whelpley presented a list of 150 names duly endorsed by members and recommended by the Council, and asked if he should read the entire list, as was the custom, or whether they should be simply posted under the By-laws at this session and laid over for subsequent action. Mr. Chas. E. Dohme, seconded by Mr. Lewis C. Hopp, moved that the list of names be now posted, but not read, until final action later, and the motion was so put and carried.

MR. WHELPLEY—In further explanation I will say, that it is customary to have a recess at the time the Nominating Committee is made up. That recess will enable us to elect these people members when we reconvene, and they will be entitled to vote. The list is here posted before you, and if there is anyone specially interested in it, I would be glad to have him take the list and look it over. This is the list of applicants here (indicating it), and you can see by whom they are endorsed.

At this point, Mr. Frank G. Ryan, chairman of the Committee on President's Address, said his committee was ready to report at this session, as instructed, on the recommendation of the President as to a joint conference of the instructors in colleges of pharmacy and the members of State

boards of pharmacy present at some convenient time during the meeting for an interchange of ideas and views in regard to certain questions, and stated that the committee concurred in the recommendation.

Mr. J. M. Good, of St. Louis, asked for the reading of that section of the By-laws having reference to the election of new members, and the Secretary read Article II. of Chapter VII. of same. Mr. Good said his impression had been that the list of applications would have to be voted on at another session, but that the reading of the section of the By-laws referred to showed that it could properly be acted on at this session.

THE PRESIDENT: Members of the Association: The report of the Committee on President's Address on the particular recommendation in regard to joint meeting of members of boards of pharmacy and instructors in colleges of pharmacy present is now before you. What will you do with it?

Mr. C. R. Sherman, of Omaha, moved to adopt, and the motion was put and carried.

MR. WHELPLEY: Now, Mr. President, we have here the minutes of the Council's work transacted by correspondence since our last annual meeting. But before reading them I would say that the minutes of the Second Session of the Council, held just previous to our adjournment at Philadelphia, were published in the last volume of the Proceedings. These have not been read before the Association or approved by it, and I bring this matter to the attention of the members now, and would like to know whether the Association desires to let the matter stand as it is, or whether it is desired by a formal vote to approve the minutes of the Second Session of the Council as published.

THE SECRETARY: I think the Secretary of the Council is laboring under a misapprehension. The late Secretary, Mr. Kennedy, read the minutes of the last session of the Council at Philadelphia before the Association at its last session there before bidding us good-bye, and they were then approved, and on the strength of that approval they were published in the Proceedings.

Mr. Whelpley then next read the minutes of the Third Session of the Council held at the Grand Hotel, Mackinac Island, Mich., at 9:30 a. m., Monday, August 3, 1903. After one or two minor corrections suggested by Mr. Lowe, of Philadelphia, and Mr. Eberle, of Texas, the minutes stood as follows:

THIRD SESSION OF THE COUNCIL—AUGUST 3, 1903.

The Council was called to order in the council room of the Grand Hotel, Mackinac Island, Mich., at 9:30 a. m., by Chairman Beal.

On roll-call the following members responded: Alpers, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Payne, Schlotterbeck, Whelpley and Wooten. The absentees were: Baker, Perry, Rapelye, Sheppard and Willis.

Secretary Whelpley of the Council read the following items of business which had been transacted by the Council through correspondence since the last meeting.

On motion, the same were approved.

SAGINAW, MICH, *October 6, 1902.*

MR. GEORGE W. KENNEDY, *Pottsville, Pa.:*

*Dear Sir:* I find your letter of September 19th upon my return from a trip out of town. I inclose herewith $5.00 for membership dues, but am obliged to positively decline the honor of serving the Association as its local secretary for the coming year, as I have been planning a trip abroad, and if arrangements are completed as I now expect, I shall not be here next summer.

Very truly yours, D. E. PRALL.

POTTSVILLE, PA., *October 8, 1902.*

*Dear Sir:* It is moved by H. M. Whelpley, and seconded by C. S. N. Hallberg, that the 1902 volume of the Proceedings of the Association contain as a frontispiece a picture of Dr. Edward Robinson Squibb.

Please send your vote to the undersigned.

Respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

*Yeas*—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Hallberg, Hopp, Knox, Kennedy, Patton, Payne, Rapelye, Schlotterbeck, Sheppard, Whelpley, Willis, Wooten—18.

*No*—Beringer—1.

*Not voting*—Eberle—1.

*Conditional*—Lowe—1.

POTTSVILLE, PA., *Oct. 14, 1902.*

*Dear Sir:* It is moved by H. M. Whelpley and seconded by E. G. Eberle, that Thomas P. Cook be named as chairman of the Special Committee on Exhibits for the 1903 meeting, that Messrs. J. P. Remington and the Local Secretary be named as associates, and that Chairman Cook be instructed to name two additional members to complete a committee of five.

Please send your vote to the undersigned.

Yours respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

*Yeas*—Alpers, Baker, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Kennedy, Knox, Lowe, Patton, Payne, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten, Willis—21.

*Nays*—0.

POTTSVILLE, PA., *Nov. 1, 1902.*

*Dear Sir:* It is moved by H. M. Whelpley and seconded by S. A. D. Sheppard, that the date of the 1903 meeting of the American Pharmaceutical Association be changed from Monday, August 10th, to Monday, August 3. This motion was made on account of the representation of the Grand Hotel people who state they can accommodate us to a much better advantage during the first week in August than at the time decided upon by the Association.

Please send your vote to the undersigned.

Yours truly, GEO. W. KENNEDY, *Secretary of the Council.*

*Yeas*—Alpers, Baker, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hopp, Kennedy, Knox, Lowe, Patton, Payne, Rapelye, Sheppard, Whelpley, Willis, Wooten—19.

*Nays*—Hallberg—1.

*Not voting*—Schlotterbeck—1.

SCIO, O., *January 15, 1903.*

*To the Members of the Council of the A. Ph. A.:*

*Gentlemen:* With feelings of profound sorrow your chairman begs to announce the death of George W. Kennedy, Secretary of the Council, who passed away on Monday, December 22, 1902.

I am also requested to submit for vote the following motions:

1. Moved by S. A. D. Sheppard, that one-half year's salary of the Secretary of the Council, and one-half year's salary of the Secretary of the Committee on Membership be paid to the estate of the late Geo. W. Kennedy.

2. Moved by S. A. D. Sheppard, that the compensation of the person who shall act as Secretary of the Council for the remainder of the unexpired term be fixed at seventy-five dollars ($75.00).

Please send your vote upon the above motions at once to the General Secretary of the American Pharmaceutical Association, Chas. Caspari, Jr., 109 Aisquith St., Baltimore, Md

Very truly yours, JAMES H. BEAL.

*Yeas*—Alpers, Baker, Beringer, Caspari, Diehl, Hopp, Knox, Lowe, Patton, Payne, Schlotterbeck, Sheppard, Rapelye, Whelpley, Wooten—15.

*Nays*—None.

*Not Voting*—Beal, Cliffe, Eberle, Hallberg, Willis—5.

SCIO, O., *January 27, 1903.*

*To the Council of the American Pharmaceutical Association:*

It is moved by Clement B. Lowe, and seconded by John F. Patton, that the Treasurer of the Association be given authority to sell the United States bonds in which the three Trust Funds of the Association are now invested, and to re-invest the proceeds in Massachusetts State bonds.

It is also moved that the balance of the three funds at any time awaiting investment shall be deposited in three separate Massachusetts savings banks.

This action is recommended on account of the fact that U. S. Bonds now command quite a premium, which will be lost if they are held until due, which date is only a few years off. The transaction would net the Association about one thousand dollars profit, and the security would be equally as good.

This proposed action has the endorsement of the Finance Committee and also that of the Chairman of the Council, and of the Treasurer of the Association.

Approved. CHARLES A. RAPELYE,
CLEMENT B. LOWE,
*Finance Committee A. Ph. A.*

Please send your vote upon the above motions to the General Secretary, Charles Caspari, Jr., 109 Aisquith St., Baltimore, Md.

Very truly yours, J. H. BEAL, *Chairman of the Council.*

*Yeas*—Alpers, Baker, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Knox, Lowe, Patton, Payne, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten—17.

*Nays*—None.

*Not voting*—Beal, Hopp, Willis—3.

SCIO, O., *January 27, 1903.*

*To the Council of the American Pharmaceutical Association:*

Your Chairman desires to announce that the following persons have been put in nomination for Secretary of the Council, to fill the vacancy caused by the death of our esteemed fellow-member, George W. Kennedy, of Pottsville, Pa.: ,

Dr. H. M. Whelpley, St. Louis.

Nominated by S. A. D. Sheppard, of Boston.

Nomination seconded by C. S. N. Hallberg, of Chicago.

H. V. Arny, of Cleveland.

Nominated by Lewis C. Hopp, of Cleveland.

Please send your vote upon the above to the General Secretary of the Association, Charles Caspari, Jr., 109 Aisquith St., Baltimore, Md.

Very truly yours, J. H. BEAL, *Chairman of the Council.*

For H. M. Whelpley: Alpers, Baker, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Payne, Rapelye, Schlotterbeck, Sheppard, Wooten—18.

*Not voting*—Whelpley, Willis—2.

ST. LOUIS, *February 18, 1903.*

*Dear Sir:* Chairman Beal requests you to kindly send your vote on each of the following motions to the Secretary of the Council of the American Pharmaceutical Association, H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.:

*Motion No. 1.* The Chairman of the Committee on Acquirement of the Drug Habit having asked for 500 reprints of the report of that committee read at the meeting at Philadelphia, it is moved by Chas. Caspari, Jr., and seconded by S. A. D. Sheppard, that said reprints be furnished.

*Motion No. 2.* It is moved by Chas. Caspari, Jr., seconded by S. A. D. Sheppard, that Mr. F. W. R. Perry, of Detroit, Mich., be elected Local Secretary for the fifty-first meeting, to be held at the Grand Hotel, Mackinac Island, August 3, 1903.

Very truly, H. M. WHELPLEY.

*Yeas*—Alpers, Baker, Beringer, Caspari, Diehl, Eberle, Hopp, Knox, Lowe, Patton, Payne, Rapelye, Sheppard, Willis, Wooten—17.

*Nays*—0.

*Not voting*—Beal, Hallberg, Schlotterbeck—3.

CLEVELAND, O., *March 2, 1903.*

MR. H. M. WHELPLEY, *St. Louis, Mo.:*

*My Dear Mr. Whelpley:* It gives me pleasure, as chairman of Membership Committee, to inform you that you have received the entire vote of the members of the Committee on Membership for Secretary of said Committee, and I as chairman declare you duly elected to said position.

Yours truly, LEWIS C. HOPP, *Chairman.*

ST. LOUIS, *March 21, 1903.*

*Dear Sir:* It is moved by S. A. D. Sheppard and seconded by J. H. Beal that the sum of $50.00 be appropriated for the new standing committee, viz., the Historical Committee.

Please send your vote on the above motion to the Secretary of the Council, H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.

Very truly, H. M. WHELPLEY, *Secretary Council A. Ph. A.*

*Yeas*—Alpers, Baker, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Knox, Lowe, Patton, Payne, Perry, Rapelye, Schlotterbeck, Sheppard, Whelpley, Willis, Wooten—20.

*Nays*—0.

*Not voting*—Hopp—1.

ST. LOUIS, *March 26, 1903.*

*Dear Sir:* It is moved by S. A. D. Sheppard and seconded by Chas. Caspari, Jr., that the sum of one hundred dollars be appropriated, in addition to the amount named in the budget submitted by the Finance Committee for expenses in connection with printing and stationery for the current year.

Please send your vote on the above motion to the Secretary of the Council, H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.

Very truly, H. M. WHELPLEY, *Secretary Council A. Ph. A.*

This motion was adopted unanimously.

ST. LOUIS, *March 30, 1903.*

*Dear Sir:* Thomas P. Cook, chairman of the Committee on Exhibition, having submitted his views regarding the outlook for a successful exhibition at the annual meeting, to be held at Mackinac Island, in August next, and having advised that under existing circumstances the exhibition feature be omitted this year, it is moved by Chas. Caspari, Jr., and seconded by S. A. D. Sheppard, that the suggestion of the chairman be concurred in and that no exhibition be held at the coming annual meeting.

Please send your vote on the above motion to the Secretary of the Council, H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.

Chairman Beal requests me to inform you that Mr. Cook has resigned as chairman of the Committee on Exhibits and to call your attention to the following extracts from Mr. Cook's letter:

"I do not think that the exhibition feature can be made much of a success at the coming meeting on account of its location and the character of its surroundings. The average manufacturer is apt to jump at the conclusion that the attendance at Mackinac will be considerably less than at a more central and more popular point. He is also influenced by the local conditions, being imbued with more commercialism than other classes of our membership, he would think a large commercial city a better place to exhibit than at a summer resort. His expenses in exhibiting in such a place would be greater than in a commercial centre, and the difficulties of his representatives would be much greater at Mackinac than at, say Philadelphia, for the reason that there is nothing on the island but the big hotels, and I think one drug store. Everything would have to be prepared at headquarters and shipped to Mackinac, and they would have to depend upon the hotel help to install the exhibit.

"It seems to me that this would be a good year to omit the exhibition feature. As desirable as such things may be for the Association, my observation has led me to believe that manufacturers do not enthuse very much over this exhibition matter. From their standpoint, they believe that this thing has served a good purpose in the past, but time has brought changes in methods of doing business, and it is hard work to make them see the advisability of incurring the very large expense necessary to acquit themselves creditably in this work."

H. M. WHELPLEY, *Secretary Council A. Ph. A.*

*Yeas*—Alpers, Beringer, Caspari, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Payne, Perry, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten—17.

*Nays*—Baker—1.

*Not voting*—Beal, Cliffe, Willis—3.

ST. LOUIS, *April 16, 1903.*

*Dear Sirs:* It is moved by Dr. Geo. F. Payne, and seconded by Dr. H. M. Whelpley, that the President of the American Pharmaceutical Association be authorized to appoint a committee of five to investigate the matter of the proposed National Bureau of Medicine and Food, which it is proposed shall be controlled by the American Medical Association and the American Pharmaceutical Association, electing its board of directors, the intention of the bureau being to improve the conditions of Therapeutics, Materia Medica and Pharmacy, and of securing goods that may be relied upon to be as labeled, said committee to report the result of this work at our next meeting, that intelligent and decisive action may be taken in regard to the matter.

Please send your vote on the above motion to the Secretary of the Council.

Very truly, H. M. WHELPLEY, *Secretary Council A. Ph. A.*

ATLANTA, GA., *April 9, 1903.*

*To the Council of the American Pharmaceutical Association:*

*My Dear Sirs:* I enclose you copies of letters which I have recently received, and

which explain themselves. It would seem that the present is an excellent opportunity for the American Pharmaceutical Association and the American Medical Association to get in closer touch than ever before in work so vital to both professions. The present enormous number of remedies for which great claims are made is being constantly augmented by new accessions to the list.

Many of them are of value, while many others are old substances or combinations masquerading under new names, and often worth far less than other well known preparations. Any relief which can be given to pharmacists in regard to weeding out unworthy remedies which are put upon the market will be of material value to them in lessening the amount of capital which is necessarily locked up in such unworthiness. Such capital would be a better investment if placed in goods of acknowledged merit, and the intention of the proposed bureau is to let both professions know which goods are worthy and which are not. This, it would seem would be a great benefit not only to the two professions, but to the ill and suffering among our people.

I have laid this matter before the Council that we may all be properly posted in regard to it, and request authority at your hands to appoint a committee of five to look into the matter and report at our next meeting.

Please give your prompt vote, as I wish to appoint the committee in time for the New Orleans meeting of the American Medical Association. The Secretary of the Council will lay our motion before the Council. Your prompt vote will be appreciated.

Yours truly, GEORGE F. PAYNE.

[*Copy.*]

NEWARK, N. J., *Feb. 11, 1903.*

*Dear Dr. Payne:* I take this occasion of writing to you informally concerning a formal proposition which will be made to you later, as the President of the A. Ph. A. Your full understanding of the latter will doubtless involve quite a little correspondence. After this has taken place I will submit the matter in formal shape.

You are doubtless aware that some years ago Dr. F. E. Stewart exploited before the American Medical Association and American Pharmaceutical Association, a plan for getting control of the trade in pharmaceutical preparations in the hands of an authorized and competent scientific bureau, with a view of rendering effective the provisions of the U. S. P. concerning official articles, and to apply the same principles in case of articles which are not official. The subject of improving the quality of the drugs and medicines of the market has been of growing importance for two decades. It is not, so far as I know, ignored by any one, but the task of subjecting the business to general control has been so stupendous that there has been a general aversion to entering upon this as a practical undertaking. The pure food and drug laws of the several States have been expressions of the general feeling in regard to the subject, but as you well know they have been quite ineffective.

I think you will agree with me that any attempt to do work of this kind by means of state or national legislation is quite hopeless, taking the country at large. Appointments will be political, and execution will be corrupt. The clear recognition of these facts has led a number of prominent people connected with the two national Associations to finally come back to Stewart's proposition for having the work undertaken by these two Associations. After two or three years of close study, it was finally decided by Drs. Stewart, Wilcox and myself that a practical scheme could be devised, and we undertook the formation of a Bureau for this purpose. I must state at this point that we had no intention of ourselves conducting or controlling, in any way, this Bureau, but merely acted to formulate a plan, effective in corporation, and then turn the whole matter over to the official conduct of these two Associations.

Matters have now gone so far that a constitution and by-laws have been drawn up and adopted, under the highest legal advice, and most of the details have been studied out. The general plan contemplates the election from the Am. Med. and Am. Ph. Assns. of ten directors, five from each, one change in each to be made annually. Pending such election, and as a means for preliminary organization, it is necessary that the five directors from each society should be appointed by the Presidents. This, of course, does not commit the societies in any way. The action is only provisional and advisory.

Most of the leading members of the Am. Med. Assn. have endorsed the plan, and there is no doubt that it will be adopted, in its present form or with slight modifications, at their next meeting. President Billings is enthusiastic on the subject, and is ready to make his appointments. A copy of his letter of endorsement will be sent to you in two or three days. I am at the present time enclosing a preliminary announcement of the objects and general methods of the Bureau, which is to be printed and distributed.

These communications will probably be all that you will care for at the present time. As soon as you

have sufficiently considered them, please let me hear from you and fire at me any questions you desire answered.

Yours sincerely, (Signed) H. H. Rusby.

[*Copy.*]

National Bureau of Medicines and Foods.

The idea of establishing a board of qualified experts who should represent the interests and the support of the professions of Medicine and Pharmacy, and through the medium of such a board first, secure more general conformity to the standards of the Pharmacopœia; second, provide drugs and chemicals that will be actually as labeled and can be relied upon; and third, deal in a proper professional and ethical manner with the large and ever-increasing number of proprietary mixtures and preparations that are being presented to the medical profession, was first suggested by Dr. F. E. Stewart at the meeting of the Am. Med. Assn. in 1881.

This idea has been elaborated and plans have been formulated which it is thought will secure the objects desired. These plans have been approved by a number of representative manufacturers, physicians and pharmacists, and it now simply remains to be seen whether the professional men of the country, and especially the members of the Am. Medical and the Am. Pharmaceutical Associations really desire relief from the present unfortunate and distressing condition of Materia Medica and Pharmacy.

Primarily, this plan contemplates the voluntary association of honest manufacturers and pharmacists who will agree with the board of experts representing medicine and pharmacy, upon standards of identity, purity, quality and strength, to which their products shall conform, and will farther agree to carry out these standards and to comply with the necessary rules governing manufacture, etc.

Organization for the purposes indicated has been begun by the formation of a corporation on the membership plan—no stock issued and not for profit—under the name of the "National Bureau of Medicine and Foods," and all members of the American Medical and American Pharmaceutical Associations are made members of this bureau. It is proposed that the Board of Directors governing this bureau be elected by these two associations, each electing five directors, one from each association retiring annually and a successor elected for five years.

In order to indicate to the physician, the pharmacist, or purchaser such articles as comply with the standards of identity, purity, quality and strength, and may in consequence be relied upon to conform truthfully with the labels affixed, and also to reward the honest manufacturer and pharmacist for his honesty, and aid him in competition with dishonest or impure products, those manufacturers and pharmacists who affiliate with the bureau in this work will be authorized to print upon the labels of their products as are placed under the supervision of this bureau a certificate of identity, purity, quality and strength of the form indicated by the board of directors.

All possible precautions in the way of frequent inspection, analysis or assay, will be taken by the bureau in order to keep certified products up to the standard and to protect the Bureau certificates from fraud. In addition to the original analysis or inspection of each batch, every article bearing the Bureau certificate will be purchased in open market from time to time and be submitted to analysis, assay and comparison with standard samples.

The Bureau will also gather and diffuse reliable information relative to Materia Medica products, chemicals and food stuffs, and to those who manufacture or deal in the same, and it is believed that in a comparatively short while such information will replace and do away with the one-sided and unreliable trade literature which is at present, in many instances, the only available source of information.

The work of the bureau will be purely commendatory and not in any way condemnatory, so that it can in no event become an agent of blackmail.

As the bureau is not a commercial enterprise, is not organized for profit or money-making, only the actual expense of doing the work required will have to be defrayed. It is proposed to assess this actual cost upon the various manufacturers and producers whose goods are certified by the bureau, each in proportion to the amount and value of the goods certified. This feature of the plan has been considered satisfactory by those who have signified a willingness to affiliate with the Bureau.

In addition to the two associations already mentioned, any scientific society that may vote to affiliate with the Bureau may do so and its members then become members of the Bureau; and further, any person who so desires or who is willing to signify his approval of the aims and objects of the Bureau, may become a member upon the payment of one dollar per year.

[*Copy.*]

Forest Hill, Newark, N. J., *Feb. 21, 1903.*

*Dear Dr. Payne:* It has given me great pleasure to receive your letter of February 17th and to learn therefrom that while you cannot, with your present limited knowledge of the undertaking, fully endorse the plan which was suggested to you, you yet approve of the object and general features of the plan, and that you are open to receiving further information.

Dr. Philip Mills Jones, whom you probably know by reputation as a prominent medical editor and the head of the organization of the California State Medical Association, is now with me, and I have just submitted your letter to him.

I am now enclosing a copy of the letter of President Billings to Dr. Jones, of which I spoke in my last communication with you.

I am also enclosing a copy of a circular letter which I am sending to the prominent members of the A. Ph. A.

Referring now to your query as to the method of raising funds for carrying on the work of the Bureau, I have to say that all possible methods have been thoroughly canvassed and we have not been able to discover any other that is practicable. A more important fact, however, is that we feel very sure that the detailed plan for operating the work of the Bureau not only absolutely prevents the possibility of the Bureau showing favoritism, but it makes this fact so very clear that it would be impossible for any one to make the suggestion.

You must, of course, recognize the fact that a certain amount of confidence constitutes the ultimate basis of every human enterprise. This element we supply in the form of the reputation and authority of the two national associations. While we feel that this is ample, it is our intention to make as light drafts as possible upon this element of confidence, and to rely for support upon the establishment of conditions which will render fraud or deception practically impossible. I may say in a general way that among those who will make examinations of the different substances will be the scientific representatives of the very houses whose goods are under examination.

A house will receive say, a dozen samples of Nux Vomica. These may be all representatives of the product of that very house or of some other one house or of one dozen different houses. The firm receiving them will be prevented, by appropriate methods from recognizing their own or any other preparation. Checks and re-checks of this kind are provided by a perfect system. You will see when all these details are finally made known, they must in the nature of the case wipe out all objections even from the most querulous.

I neglected to mention above that Dr. Jones is undertaking the organization of the Bureau. He is working without salary at the present time, and plans are under way for securing funds for this preliminary work.

Yours sincerely, (Signed) H H. Rusby.

[*Copy.*]

100 State St., Chicago, Ill., *Jan. 16, 1903.*

Dr. Philip M. Jones, *166 Macon St., Brooklyn, N. Y.*

*Dear Dr. Jones:* I have received your two reports concerning the progress you are making in reference to the National Bureau of Medicines and Foods, and I am glad to hear of the success with which you are meeting in the East.

Let me know from time to time how you get on, and I shall be glad to hear from you on or before April 1st of some suggestions as to just how you would like to have me present the matter in as short a way as possible to the House of Delegates of the American Medical Association.

Believe me, very sincerely yours, (Signed) Frank Billings.

[*Copy.*]

New York City, *March 19th, 1903.*

Dr. George F. Payne, 43½ *Whitehall St., Atlanta, Georgia.*

*My Dear Dr. Payne:* Dr. H. H. Rusby has asked me to give you a statement as to the present status of the proposed National Bureau of Medicines and Foods, for the reason that he is too busy to devote much time to the matter just at present. The task he has allotted me is, I can assure you, a pleasant one.

Up to a few weeks ago nothing in the way of investigation, etc., has been suggested by either of the Associations which it is proposed shall control the Bureau by electing its board of directors. I was asked by Dr. F. E. Stewart, who I believe originated the idea of such a bureau in 1881, to look into the matter and see whether I thought it could be done, and in what way. I found at once that there was crying need for some means of dealing with the situation; of improving the conditions of therapeutics, materia medica and pharmacy, and of securing goods that might be relied on to comply with the labels. Consulting with a large number of physicians, I found that they were prepared to stand by any right move: and with pharmacists that they would co-operate towards the ends desired.

I then took the idea of Dr. Stewart and formulated the plan as it remains at present, and which I believe Dr. Rusby has placed before you. Dr. Billings considered the matter of great importance, and appointed a special committee to look into it and report at the New Orleans meeting of the American Medical Association. This committee, of five members, and of which I am a member, has unanimously agreed that the proposed measure is a good one, and that proper steps should be taken to see that it is carried out. What the recommendations of the committee will be, of course cannot be stated till after the meeting of the A. M. A.

What is desired now, is that a similar committee should be appointed by you as President of the A. Ph. A., to investigate the proposed Bureau and report at your next meeting. If this committee should confer with the A. M. A. committee and find that their views were more or less in common, they would then ask you or your Council to be instructed to act with the commitee of the A. M. A., so that the work of

the committees could be done in harmony. I do not think it is a case of one Association meeting the other, or vice versa, but of the two Associations joining forces in order to do what is universally declared should be done, or rather to determine in what way the work should be done, and then recommending this way to their Associations.

This movement will bring the better elements in the professions of pharmacy and medicine into closer touch upon a common ground of honesty of purpose, and the time seems most propitious for bringing about this happy result. I should think that you could appoint a committee with the same status and functions as the committee appointed by Dr. Billings, viz.: to investigate the proposed measure and report to the American Pharmaceutical Association. The committee would have no authority to do anything any more than our committee has authority to act: the two would simply study the plan and advise their respective Associations what they thought about it. Of course, as these two Associations meet at different times in the year, one in the Spring and the other in the Fall, one of them must necessarily take some definite action in the matter before the other.

I feel quite sure that every member of our committee would be pleased if we can report to the American Medical Association that the President of the American Pharmaceutical Association has taken the same friendly attitude toward the proposed Bureau that our own President has assumed, and has appointed a similar committee to look into the plans. I think we would then ask to be instructed to confer with your committee, and I doubt not that the proper instructions would follow: but if there is no committee of your Association, we cannot put the matter in that shape. Will you not look into the question further and see whether you cannot appoint such a committee before the A. M. A. meets, May 5th?

If you will be good enough to advise me as to your views in this connection, I shall be greatly obliged. Trusting to hear from you at your convenience, I beg to remain,

Very truly yours, (Signed) PHILIP MILLS JONES.

*Yes*—Alpers, Beal, Caspari, Diehl, Eberle, Hallberg, Hopp, Patton, Payne, Schlotterbeck, Sheppard, Whelpley, Wooten—13.

*Not voting*—Baker, Beringer, Cliffe, Knox, Lowe, Rapelye, Willis—7.

115 W. 68TH ST., N. Y. CITY, *March 30, 1903.*

*To the Members of the Council, A. Ph. A.:*

*Dear Sirs:* Permit me to ask your careful consideration of an important movement designed to improve certain unfortunate conditions in pharmacy and medicine, and to urgently request that you will, at your earliest convenience, take the action indicated below.

A number of prominent physicians and pharmacists have been for several years engaged in studying out a practical plan for the establishment of a board of standardization, to act between the manufacturer on the one side and the pharmacist on the other. Such a plan appears to have finally been devised and quite thoroughly perfected. All hope of government control in the near future having been abandoned, it has been determined to reach the desired end through the medium of an association of the professional interests most directly concerned. The plan advanced has met the approval of all the professional and commercial interests to which it has been submitted, and, without going into detail at length, I may say that the minute details of business management and probable complications, no less than the broad and general scheme of the enterprise, have been considered and worked out to the fullest extent, and that the plan as herein outlined, in spite of its formidable magnitude, is not only possible but is actually practicable from a business point of view as well as from a professional standpoint. In brief, the plan is as follows:

To establish a membership association, making all members in good standing of the A. M. A. and the A. Ph. A. members of the new association, to be known as the National Bureau of Medicines and Foods, placing the control of the bureau in the hands of a board of ten directors or trustees, five elected by the A. M. A. and five by the A. Ph. A., one from each association retiring annually and a successor being elected for five years, It is proposed to draw into association with this bureau the manufacturers of chemicals, pharmaceuticals and food-stuffs, and to certify to the purity, identity, quality and strength of such products of these manufacturers as can, through analysis, assay or other means be so certified, and to maintain the standards fixed by this board and agreed to by the

associated manufacturers. The board of directors, who would do all the scientific work of establishing standards, formulating rules for enforcing them, etc., would have nothing to do with the business of the bureau, and would not receive subsidies for their opinions as to standards. It is not proposed to make the bureau a money-making institution, but simply to have its actual expenses defrayed by those who most profit financially from its existence. The actual expenses will be assessed upon the manufacturers whose goods are certified by the bureau, each in proportion to the value of the goods so certified. It is proposed to place the work of conducting the actual business of carrying on this work, under the rules established by the board of directors, in the hands of a competent general business manager. It is not proposed to establish standards in conflict with those of the Pharmacopeia or with the principles underlying them, but rather to carry out and make actually effective the standards and principles of that work, and to properly deal with the exceedingly large and vexing problem of "proprietary" remedies. The details of the proposed plan for handling this very delicate question are too extended and complicated for discussion in this letter, but they have been carefully studied, and will, I am sure, be found generally acceptable.

Dr. Frank Billings, President of the American Medical Association, has appointed a special committee to investigate the plan of the proposed bureau and to report its findings to the House of Delegates at the coming meeting of that Association at New Orleans. That committee is as follows: E. Eliot Harris, chairman, New York; Nathan S. Davis, Jr., Chicago; H. Bert. Ellis, Los Angeles; Solomon Solis-Cohen, Philadelphia; Philip Mills Jones, San Francisco. Dr. Jones has given most of his time for the past year to a careful and exhaustive study of the whole question and of its bearings upon the professions and the commercial interests at stake. It is very important that the above-named committee should be able at the New Orleans meeting to make the announcement that a similar committee of the American Pharmaceutical Association also has been appointed to consider this matter and to act with it in further deliberations. Our President, Dr. Payne, has been requested by me to appoint such a committee, but is of the opinion that it would be better to do so after instruction by the Council of the Associatton. I am, therefore, addressing each member of the Council and presenting the request that our President be instructed to appoint such a committee to confer with the committee of the American Medical Association, and to act with it in investigating the proposed establishment of this National Bureau of Medicines and Foods.

In view of the present unhappy condition of pharmacy, and of the misunderstandings which exist between it and medicine, it seems especially important that the American Pharmaceutical Association should quickly respond to this request and so demonstrate to the American Medical Association that we stand heartily for anything that will tend to the betterment of pharmacy and medicine, and that we gladly co-operate with them in investigating or undertaking anything that in the judgment of ten such men is worthy of investigation or undertaking.

Since the American Medical Association meets on the 5th of May, I trust that you will take the matter up with Dr. Payne and endeavor to have such a committee appointed before that date. Even in the unexpected event that our committee shall find the proposed plan, after such modification as may be suggested, to be not feasible, no harm will have been done; rather, we will have somewhat strengthened the bond between the two Associations by showing our alacrity to co-operate with them in such matters.

Let me earnestly ask you not to treat this matter as visionary and impracticable; some of our leading men, in control of the largest commercial enterprises involved, have considered the plan and find it perfectly practicable. I think that we now have the opportunity to do for ourselves what the government has been requested to do and has not done, and that no effort should be neglected to secure the ends desired. Dr. H. W. Wiley, of the United States Department of Agriculture, makes the following criticism of

the proposed bureau: "The functions of such a bureau as you propose would be the full discharge and execution of the national pure food and drug laws. If it were certain that there would never be such legislation, there would be a greater reason for the establishment of a bureau such as you propose."

I should like to add, in conclusion, that the underlying principle of the proposed plan is that of inducing rather than coercing. The entire scheme has been elaborated with the idea of rendering it attractive to each element entering into the Association to seek the accomplishment of the ends sought by the bureau. In this the attempt differs from all others previously made. To attempt to improve fundamental conditions by enforcing penalties upon unwilling subjects, offers the least hope of a successful result; that which we contemplate appears to offer the greatest.

Very truly yours, H. H. RUSBY.

CAMDEN, N. J., *April 21, 1903.*

DR. JAMES H. BEAL, *Chairman of the Council A. Ph. A., Scio, O.:*

*Dear Sir:* I am impressed with the magnitude of the proposition to establish a National Bureau of Medicine and Food, as set forth in Motion No. Six, now before the Council for consideration, and in the letters accompanying that motion.

The subject is so far-reaching in the work contemplated, the responsibilities are so enormous, and it is fraught with possibilities of such great dangers, that the entire matter should receive the most careful consideration. In my opinion, a safe conclusion can only be reached after a full and free discussion and presentation of all the pros and cons. Such a discussion through the medium of correspondence is not practicable. Until we are fully enlightened and a clear understanding of the position and responsibility of the American Pharmaceutical Association can be obtained, I fail to see how we can act intelligently.

A proposition of such stupendous magnitude and vital importance demands thoughtful deliberation, and in the writer's opinion no action should be taken that would in any way commit this Association to the extent of even an unofficial or *quasi* endorsement of what might be diverted into a gigantic scheme.

The Association can ill afford to become a tail to any kite, and hasty action is certainly not warranted or called for. If the proposition merits our support it will not suffer from the delay incident to a more careful and deliberate consideration and investigation.

The American Pharmaceutical Association has never failed to meet in a proper spirit the friendly advances of contemporary scientific societies and our desire to extend reciprocal comity with the American Medical Association is fully established by past actions and such an argument can have little weight, and must play but a very insignificant part in the discussion of this enormous proposition.

I fear that the adoption of Motion No. Six at the present time would give the American Medical Association the wrong impression, namely, that the American Pharmaceutical Association was committed to the support of the plan suggested. Would it not be more in keeping with the dignity and proper position of the American Pharmaceutical Association to act independently and postpone any expression of opinion or action of our Association until more deliberate consideration can be obtained?

I therefore move that the consideration of Motion No. Six, relating to the establishment of a National Bureau of Medicine and Food be postponed and the subject referred to the fifty-first annual meeting of the Association.

Yours respectfully, GEORGE M. BERINGER.

I heartily endorse or second the above motion. CLEMENT B. LOWE.

*Philadelphia, April 22, 1903.*

*Nays*—Alpers, Baker, Beal, Caspari, Diehl, Hallberg, Patton, Payne, Perry, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten—14.

*Yeas*—Beringer, Lowe—2.
*Not voting*—Cliffe, Eberle, Hopp, Knox, Willis—5.

ST. LOUIS, MO., *May 4, 1903.*

*Dear Sir:* The Association appointed a committee on semi-centennial celebration, with an appropriation of $200.00. As the work advanced to much larger proportions than were anticipated, the committee were obliged to spend more than double the appropriation.

The thanks of the Council are due to Mr. W. L. Cliffe and other Philadelphia friends, who would not allow the extra amount to be drawn from the A. Ph. A. treasury, but paid the remaining bills by personal subscription.

Therefore it is moved by S. A. D. Sheppard and seconded by J. H. Beal that this generous action be now gratefully acknowledged by Council.

Please send your vote on Motion No. 8 to

Yours truly, H. M. WHELPLEY, *Secretary Council A. Ph. A.*

*Yeas*—Alpers, Baker, Beal, Beringer, Caspari, Diehl, Eberle, Hallberg, Hopp, Lowe, Patton, Payne, Perry, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten—18.
*Nays*—0.
*Not voting*—Cliffe, Knox, Willis—3.

PHILADELPHIA, PA., *May 22, 1903.*

DR. H. M. WHELPLEY, *Secretary of Council A. Ph. A.:*

*Dear Doctor:* Your kind favor notifying me and through me the Philadelphia friends of the A. Ph. A. who made up the deficit of the Committee on Historical Exhibit of the action of the Council in passing resolutions of thanks for their contributions is at hand.

On behalf of the gentlemen who are mentioned by this resolution, permit me to say that on account of the historic and educational value of the exhibit it was thought by them justly due to the city to sustain its reputation for protecting such enterprises, and that this evidence of the appreciation of their action will be received with pardonable pride.

Sincerely yours, W. L. CLIFFE.

ST. LOUIS, MO., *May 7, 1903.*

*Dear Sir:* Whereas the amount appropriated last year by the Finance Committee for the 1902 Proceedings ($2,500) has been found inadequate to cover the expense of publishing and delivering said book, on account of the increased size of the volume and the additional expenses due to insertion of plates, portraits, etc.

It is therefore moved by Charles Caspari, Jr., and seconded by S. A. D. Sheppard, that an additional sum of $1,000.00 be appropriated for the Proceedings and added to the budget of expenditures for the fiscal year, ending June 30, 1903.

Please send your vote on motion No. 9 to the undersigned.

Very truly, H. M. WHELPLEY, *Secretary Council A. Ph. A.*

*Yeas*—Alpers, Baker, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Lowe, Patton, Payne, Perry, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten—19.
*Nays*—0.
*Not voting*—Knox, Willis—2.

ST. LOUIS, MO., *May 25, 1903.*

*Dear Sir:* It is moved by S. A. D. Sheppard, and seconded by Chas. Caspari, Jr., that any balance remaining, at the end of the fiscal year, of the special appropriation for compiling the collective index for fifty years (see 1902 Proceedings, page 173) be carried forward for use the following year.

Please send your vote on motion No. 10 to the undersigned.

Very truly, H. M. WHELPLEY, *Secretary Council A. Ph. A.*

*Yeas*—Alpers, Baker, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Payne, Perry, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten—20.

*Not voting*—Willis—1.

St. Louis, Mo., *June 15, 1903.*

*Dear Sir:* It is moved by J. E. Beal, and seconded by H. M. Whelpley, that the following report be adopted.

Please send your vote to the undersigned.

Very truly, H. M. Whelpley, *Secretary of A. Ph. A. Council.*

*Budget of Expenditures of the American Pharmaceutical Association for the Fiscal Year, July 1, 1903, to July 1, 1904.*

| | |
|---|---|
| Salaries | $2,800 00 |
| Proceedings | 3,000 00 |
| Miscellaneous Expenses | 250 00 |
| Printing and Stationery | 400 00 |
| General Prizes | 200 00 |
| Traveling Expenses | 200 00 |
| Stenographer | 150 00 |
| Badges and Bars | 40 00 |
| Journals for Reporter on Progress of Pharmacy | 50 00 |
| Section on Scientific Papers | 25 00 |
| Section on Education and Legislation | 25 00 |
| Section on Commercial Interests | 25 00 |
| Section on Practical Pharmacy and Dispensing | 25 00 |
| Committee on Transportation | 25 00 |
| Committee on Membership | 25 00 |
| Committee on Historical Pharmacy | 50 00 |
| Insurance | 20 00 |
| Premium on Treasurer's Bond | 12 50 |
| | $7,322 50 |

Chas. A. Rapelye,
Clement B. Lowe,
John Patton,
*Finance Committee.*

*Yeas*—Alpers, Baker, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hopp, Knox, Lowe, Patton, Payne, Perry, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten—19.

*Not voting*—Hallberg, Willis—2.

St. Louis, Mo., *June 26, 1903.*

*Dear Sir:* It is moved by H. M. Whelpley, and seconded by Chas. Caspari, Jr., that forty (40) gold bars for the Mackinac Island meeting be ordered.

The enclosed program is submitted by Local Secretary Perry, General Secretary Caspari, and Secretary of the Council Whelpley.

It is moved by Chas. Caspari, Jr., and seconded by H. M. Whelpley, that the program be approved.

Please send your vote on the above motions to the undersigned.

Very truly, H. M. Whelpley, *Secretary A. Ph. A. Council.*

*Yeas*—Alpers, Baker, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Payne, Perry, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten—20.

*Not voting*—Willis—1.

PROPOSED PROGRAM FOR THE FIFTY-FIRST ANNUAL MEETING AT MACKINAC ISLAND, MICH., AUGUST 3 TO 8, 1903.

Monday, August 3, 9:30 a. m.—Council Meeting.
3:00 p. m.—First General Session.
8:00 p. m.—Social Gathering at Grand Hotel.

Tuesday, August 4, 10:00 a. m.—Second General Session.
3:00 p. m.—Session of Section on Commercial Interests.

Wednesday, August 5, 10:00 a. m.—Session of Section on Scientific Papers.
3:00 p. m.—Carriage drive around island.
8:00 p. m.—Session of Section on Scientific Papers.

Thursday, August 6, 10:00 a. m.—Session of Section on Practical Pharmacy and Dispensing.
3:00 p. m.—Session of Section on Practical Pharmacy and Dispensing.
8:00 p. m.—Stereopticon Lecture by Dr. H. M. Whelpley on Indian Sacred Red Pipe-stone Quarries of Minn.

Friday, August 7, 10:00 a. m.—Session of Section on Pharmaceutical Education and Legislation.
3:00 p. m.—Steamboat ride tendered by hotel management.
8:00 p. m.—Session of Section on Pharmaceutical Education and Legislation.

Saturday, August 8, 10:00 a. m.—Last General Session.

ST. LOUIS, MO., *July 17, 1903.*

WHEREAS the Association at the fiftieth annual meeting established a standing Committee on Historical Pharmacy, and directed the same to hold one public session annually; therefore it is

Moved by Charles Caspari, Jr., and seconded by H. M. Whelpley, that Tuesday evening, August 4, be set aside as the time for holding the public session of the historical committee.

Please send your vote to the undersigned.

Very truly, H. M. WHELPLEY, *Secretary A. Ph. A. Council.*

*Yeas*—Alpers, Baker, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Payne, Perry, Rapelye, Schlotterbeck, Sheppard, Whelpley, Wooten—20.

*Not voting*—Willis—1.

H. M. Whelpley, secretary of the Committee on Membership, presented his report, which was received and, on motion, referred to the general session.

Charles Caspari, Jr., chairman of the Committee on Publication, presented the following report, which was, on motion, accepted:

## REPORT OF THE COMMITTEE ON PUBLICATION.

*Mr. Chairman and Members of the Council of the American Pharmaceutical Association:*

Your Committee on Publication beg leave to report that the Proceedings of the fiftieth annual meeting have been published and a copy of the same delivered in April of the present year and since that time to every member entitled thereto according to the Treasurer's accounts, besides the usual number (100) of complimentary copies to our honorary members, State libraries, the pharmaceutical press, educational institutions and foreign scientific bodies. Sixteen hundred copies of the book were printed, of which 232 remain on hand in flat sheets; 1300 copies have been bound in cloth and 68 copies in

paper. It was found necessary during the past year to bind in cloth 25 copies of the 1900 volume of Proceedings and 35 copies of the 1901 volume, the stock having become exhausted. The cost of publication and delivery for the year 1902–1903 is shown by the following items:

| | | |
|---|---|---|
| Composition, paper and press work (1600 copies) | | $2,450 70 |
| Binding 1,300 copies in cloth (1902) @ 28 cts. | $364 00 | |
| " 35 " " (1901) @ 23 cts. | 8 05 | |
| " 25 " " (1900) @ 23 cts. | 5 75 | |
| " 68 " in paper (1902) @ 8 cts. | 5 44 | |
| | | 383 14 |
| Expressage and Postage: Expressage (cloth 25, 35, 36; paper 10, 40); Postage (cloth 40) | | 377 74 |
| Illustrations | | 282 52 |
| C. H. charges on Plates admitted duty-free | | 5 80 |
| Journals for the Reporter | | 44 20 |
| Salary of the Stenographer | | 150 00 |
| Salary of the Reporter on the Progress of Pharmacy | | 750 00 |
| | | $4,444 10 |

The fiftieth volume of Proceedings is with one exception (1894) the largest published in the history of the Association, containing 1,236 pages and 32 pages of prefatory matter, the unusual size being due in part to the length and increased number (79) of original papers presented at the meeting of the different Sections, and in part to the insertion, by order of the Association, of a complete list of deceased members (1852–1902) and a complete set (as far as obtainable) of portraits of the past and present officers of the Association and Sections. The 1894 volume was larger by reason of the more extended Report of the Progress of Pharmacy, consisting of 816 pages as against 434 pages in the present volume.

In accordance with instructions received at the last annual meeting, your Committee has also compiled a complete index of the fifty volumes of Proceedings, embracing about 75,000 references, for the printing and binding of which estimates have been obtained.

For the Committee, CHAS. CASPARI, JR., *Chairman.*

*Baltimore, July 2, 1903.*

H. M. Whelpley, Chairman of Committee on George W. Kennedy resolutions, presented the following report which was adopted:

## REPORT OF COMMITTEE ON GEORGE W. KENNEDY RESOLUTIONS.

Immediately following the death of our late Secretary, Mr. George W. Kennedy, Chairman Beal named the undersigned as a Committee on Resolutions. The following resolutions were drafted and an engrossed copy sent to Mrs. George W. Kennedy. At the suggestion of the Chairman, copies of the resolutions were also mailed to the pharmaceutical journals of this country.

WHEREAS, the Council of the American Pharmaceutical Association has sustained a severe loss by the death of its efficient secretary, George Washington Kennedy, who passed away after a brief illness, on December 22, 1902; and,

*Whereas*, The Council desires to record its deep sense of sorrow caused by the removal of a beloved member and officer, who for more than a quarter of a century had labored earnestly and faithfully for the welfare of the Association: who was, for years, chairman of the Executive Committee, and since the formation of the Council, in 1880, has been its secretary, and also secretary of the Committee on Membership: be it therefore

*Resolved*, That in the death of George Washington Kennedy the American Pharmaceutical Association has lost a most valuable member, one whom we recognize as an exact and conscientious officer, a

faithful member and a valued associate, who by his many sterling qualities and conscientious discharge of his duties, had gained the respect and love of all with whom he was brought in contact, and endeared himself to his official associates.

*Resolved*, furthermore, that a copy of these resolutions, with the assurance of our profound sympathy, be transmitted to the bereaved family of our late colleague, trusting that the memory of a loving and devoted husband may, in a slight measure, at least serve to soften the grief that has overcome them.

H. M. WHELPLEY, *Chairman*, St. Louis, Mo.,
CHAS. CASPARI, JR., Baltimore, Md.,
S. A. D. SHEPPARD, Boston, Mass.,
*Committee of the Council.*

*December 29, 1902.*

The following letter was received in acknowledgment of the resolutions:

POTTSVILLE, PENNA., *Feb. 21, 1903.*

*To the Members of the Council of the A. Ph. A.:*

*Gentlemen:* It is my desire to acknowledge the receipt of the kind testimonial of the Council of the American Pharmaceutical Association in memory of my father.

Your kind words of esteem are a source of much comfort to us all, and we appreciate them very much.

We all join in sending our thanks for the excellent token, expressing the esteem in which you hold my father. Very respectfully yours, GEO. M. KENNEDY.

The above report is respectfully submitted by the Special Committee on Geo. W. Kennedy resolutions.—August 3, 1903.

C. B. Lowe, Chairman of the Auditing Committee, presented the following report which, on motion, was adopted.

*July 17, 1903.*

*To the Council of the American Pharmaceutical Association:*

Your Auditing Committee would report as follows, viz.: We have this day examined the accounts and account-books of the General Secretary and find them to have been kept correctly and all moneys received have been duly forwarded to the treasurer. We find that there are a few National Formulary accounts which should be collected, if possible, or if uncollectable, the accounts should be closed by charging them to profit and loss.

We find that the books of the Treasurer have been kept correctly and that there is on hand a balance of $3832.03, which is a net increase for the Association year of $291.63. We find that on order 1309 for $805.86 there is a balance due of $95.82 on account of the appropriation for the Proceedings being exhausted.

We have also examined the sworn statement of the Chairman of the Council regarding the bonds of the Association in his possession and also the bank books of the Association and the balances of the different funds. We find them to be correct and to correspond with the Treasurer's account.

In conclusion, we find that the assets of the Association at this date are as follows:

| | |
|---|---|
| The Ebert Fund | $879 22 |
| The Centennial Fund | 1,888 65 |
| The Procter Fund | 14,014 02 |
| The General Fund | 3,832 03 |
| Total | $20,613 92 |
| Funds as per last year's report | 18,630 89 |
| Net increase | $1,983 03 |

Respectfully submitted,

CLEMENT B. LOWE,
CHAS. W. HANCOCK,
WILLIAM MCINTYRE.

H. M. Whelpley presented the names of 150 applicants for membership, which, on

motion of J. F. Patton, were referred to the Association with favorable recommendation.

Chairman Beal appointed Messrs. Hallberg, Patton and Beringer a Committee on Credentials, with instructions to report to the Association at its general session.

On motion by W. C. Alpers, seconded by W. L. Cliffe, the General Secretary was authorized to close certain uncollectable National Formulary accounts.

The Secretary of the Council read the following motion, which was referred to the next session of the Council for action.

It is moved by S. A. D. Sheppard, and seconded by Chas. Caspari, Jr., that the By-Laws of the Council be amended as follows:

Amend Chapter IV. by striking out Article IV.

Amend Chapter III. by adding the following as Article IV.: The Secretary of the Council shall also officiate as Secretary of the Committee on Membership, and for such services shall receive an additional salary of $150.00.

The General Secretary read a communication from the National Association of Retail Druggists relative to soliciting subscriptions for the "N. A. R. D. Notes." No action was taken.

On motion of C. B. Lowe, seconded by C. S. N. Hallberg, the American Conference of Pharmaceutical Faculties was requested to meet in the Council room, August 3, at 9:30 p. m.

On motion of L. C. Hopp, seconded by W. C. Alpers, the Council directed the Committee on National Bureau of Medicines and Foods to report to the general session. The Association was requested to set apart two hours' time for the consideration of the report. On motion by George M. Beringer, seconded by George F. Payne, 11 a. m., Tuesday, August 4, was set apart for the above report.

On motion of H. M. Whelpley, seconded by E. G. Eberle, C. S. N. Hallberg was authorized to distribute copies of the Epitome of the National Formulary among such members of the Association present as he deemed best.

On motion of C. S. N. Hallberg, seconded by W. C. Alpers, the General Secretary was authorized to send copies of the Epitome of the National Formulary to the various local pharmaceutical associations in the United States.

On motion of C. B. Lowe, seconded by C. S. N. Hallberg, the Committee on Publication was authorized to have 1000 copies of the Collective Index printed.

On motion of C. B. Lowe, seconded by George M. Beringer, the Publication Committee was instructed to fix the price of the Collective Index at a nominal figure above the cost of production.

On motion of L. C. Hopp, seconded by C. S. N. Hallberg, the General Secretary was authorized to employ a proof reader for the work on the Collective Index.

On motion by W. C. Alpers seconded by C. S. N. Hallberg, the General Secretary was instructed to send the Lloyd Library a set of the Proceedings of the A. Ph. A. and to place the Lloyd Library on the complimentary mailing list.

On motion by H. M. Whelpley seconded by T. V. Wooten, Roderick S. Woodruff, of Waterbury, Conn., was made a life member, old style, without the proceedings.

The General Secretary announced that Treasurer Sheppard had received a check for $50.00 from Dr. Enno Sander who presented the same as a prize for the use of the Section on Practical Pharmacy and Dispensing.

On motion by H. M. Whelpley seconded by W. C. Alpers, Thomas Lord, of Chicago, was made a life member, old style, without the proceedings.

On motion of George F. Payne seconded by T. V. Wooten, the sum of $20.00 was appropriated for the use of the Committee on Drug Habit.

On motion of J. O. Schlotterbeck seconded by J. W. T. Knox, the Council adjourned to meet again at 9 a. m., Tuesday, August 4.

Mr. W. C. Anderson, of Brooklyn, moved that the minutes be now approved.

THE SECRETARY: Before a vote is taken on that motion, I would like to call the attention of the members to the fact that the Council has recommended the publication of the semi-centennial index, involving the expenditure of considerable money. I simply want to call attention to this matter, so that you may vote intelligently. This index was ordered by the Council and the Association, and is now ready to be printed and put in the hands of the members. It involves about 75,000 references, and will undoubtedly be very valuable to any pharmaceutical library. It is very desirable that it be published, but I want you to vote intelligently on the question, and it is for this reason I call your attention to it particularly.

MR. CLIFFE: If we had the Treasurer's report before us, we would have a more intelligent idea about what to do in the matter, it seems to me.

THE SECRETARY: Estimates were submitted to the Council by different parties, and the probable number of pages that this index will require has been ascertained, and as far as we can get at it now the probable cost of the index will be about $1,200 or $1,250, without the proof-reading, which will add another hundred to it. So you might say it will cost between a thousand and fifteen hundred dollars. It is intended that the index shall be sold to those members who may desire to have a copy at a cost sufficient to cover the cost of publication and delivery. It is not intended to make it a source of profit to the Association, but simply to cover the cost.

THE PRESIDENT: As a matter of explanation in regard to the index, I have myself found our Proceedings very valuable, but I have found the want of an index a very serious difficulty. Where you wish to find a new formula or some other new matter, it is very laborious to have to look through all the books to get at it. I have had recent experience in trying to get new members by showing them the Proceedings, and in the case of one of our new members, who would not join at first, I sent him two recipes I had gotten out of the Proceedings, and told him if I hadn't gotten them out of the Proceedngs I would have charged him $25 for one and $50 for the other; and he wrote me a letter at once sending me his application, saying he had not realized what that report on the Progress of Pharmacy meant before. This index would make the report a practical one.

MR. ELIEL: It seems to me that we ought to be very careful about making any such expenditure as that without knowing whether there will be enough members who are sufficiently interested in this thing to take these copies. I hardly think it is right to burden the Association, and I know we haven't any money to throw away. We have not had in the past, and it is not well to discount the future from a financial standpoint. We have had back indexes—complete indexes published at regular intervals in the past—to which we can always refer, and I think it would be better to stick to that custom of every five or six years getting up a general index from the time the last one was issued, and incorporate it with the Proceedings, as we have done in the past. That has been done at a comparatively small cost, while this, as Mr. Caspari says, will cost from a thousand to fifteen hundred dollars. I would make this suggestion: That there would be no objection to a publication of this kind if we could get enough subscriptions from the members during the year to warrant it. There is no hurry about it, and if we could get enough subscriptions to cover, say seventy-five per cent. of the expense, that would make the Association safe. I don't believe in going into a thing of this kind blindfolded.

MR. MAYO: I move that we approve all that portion of the minutes of the Council except that part which applies to the publication of the index, and that action upon that be deferred. I offer this as a possible means of adjusting the matter. Personally, I have no doubt it is very much the best for us to proceed with the publication of the index. It would add immensely to the value of the volumes of Proceedings, both now and for the future. But I think it would be well to proceed with the manufacture of the index before we fix a price on it. Let us invite subscriptions in a tentative way, so as to ascertain the probable number we can count upon selling, and that will give us a clue to what might be considered a fair price for the index. The cost of publishing 1200 or 1000 would not be much more than for 500, but the price should depend very largely upon the subscriptions.

MR. MITTELBACH: What interest would the index have for those members having only ten or twelve volumes of the Proceedings?

MR. MAYO: There would be this benefit: If you haven't the volume, but are sufficiently interested in the subject indicated by the index, you can procure the volume and find the information.

MR. GORDON: Is the new index to cover the Proceedings for the past fifty years?

THE PRESIDENT: Yes, sir; I think so. It will cover everything for the last fifty years, is my information.

MR. WOOTEN: I desire to speak to the motion of Mr. Mayo, and to oppose it. The Council gave very careful consideration to this question this morning. The Council is very much opposed to spending a dollar of the Association's money injudiciously. We ought to look at the question from every point of view. The desirability of the publication of this index by the Association is, I believe, generally admitted, and I do not see that anything is to be gained by a postponement of consideration of the matter. It will cost, as the gentleman said, very little more to print 1000 copies—and keep a portion of them unbound—than it will cost to print 500 copies. If it is desirable to have it at all, it seems to me we are just as well prepared to vote on the question now as we shall at any other time. It is intended that we shall sell these copies at approximately their cost. The Association's money will not, therefore, be invested over and above a few hundred dollars in these copies of the index. For these reasons I believe we are fully prepared to vote on this question now, and I oppose the motion to postpone consideration to some future time.

MR. MAYO: My motion was simply a *pro forma* motion, to enable Mr. Eliel to speak to the question, which, under the circumstances he could not properly do, because there was no motion before the house. As I said before, personally I am heartily in favor of the publication of the index.

MR. ALPERS: Mr. President, this question has two sides to it, there is no doubt about that, but I agree with Mr. Wooten that it is just as well to have this matter out of the way as to postpone it and devote more valuable time of the meeting to its consideration. To the student of pharmacy, to the man who is interested in the development of pharmacy, an index is indispensable, at whatever cost. It is invaluable to those desiring to find subjects treated of in the Proceedings. This subject was discussed in the Council this morning, and almost all the members tried to find a certain article in the Proceedings, and failed to find it for want of an index. They knew it was there, but could not find it. The index is indispensable. I regret very much that a card index was not ordered instead of a printed index—but that matter is not under discussion just now. It is absolutely necessary for the development of pharmacy that this index shall be printed.

It should be remembered that this money is not lost; it will come back gradually; not at once, probably, but I have no doubt two or three hundred indexes will be sold at once. Every pharmaceutical college, every pharmaceutical publication, every student of pharmacy, every professor in our institutions, will want this index, without question. Nobody can deny that. So there is a large number of people who will want the index at once, and I am in favor of going ahead with the matter.

MR. WHELPLEY: In considering this matter we should remember that last year this Association approved the action of the Council in authorizing the General Secretary to go to an expense of $300 to have the manuscript for this index prepared. This has been done. You should also remember that the decennial index is due, and past due, and in the ordinary course of events we would go to the expense of making a decennial index, so the expense of that index should be subtracted from the cost of the collective index proposed. You should also remember that the total expense for the index is not immediate; only those volumes that are required for immediate distribution need be bound at once; the remaining sheets can be held in abeyance until more are needed. You should also remember that the tendency of the times is decidedly in the direction of greater use of pharmaceutical libraries, and that more people to-day than ever before are industriously consulting just such indices as we propose to publish, and that the fact that a person does not have a complete set of Proceedings by no means indicates that he cannot use the index as a matter of information, and then go to some trouble and expense if necessary to procure or gain access to the special volumes that he may desire to consult. I trust that the motion will not prevail, and that we will approve the minutes of the Council as presented.

MR. EBERT: The Council in making their report first should have stated the fact that they have got the money—that we do not lack the money to publish the index. There is no question about the value of the index, though I want to say I have never found the difficulties mentioned here to-day about not being able to find in the Proceedings the subject you are looking for. It is the only book I use, and I have no such difficulty.

THE PRESIDENT: When I spoke of the value of an index it was not in regard to an index for the whole fifty years, but related to my experience with one volume only.

MR. EBERT: If the Council says it has the money to do this work, it is simply for us to vote that the money be expended. But Mr. Caspari comes to us and cautions us in regard to the expenditure. I am not in the Council, but I have heard we have not a large amount of money. Before you go into a business transaction it is well to know you have the money to do what you intend to do, and to pay for it. It seems to me good business that, as we have the index prepared, we can very readily find out inside of a year how many copies we can dispose of to our members. We also know how many libraries there are in the United States and other countries that usually get our Proceedings, and we can find out whether they will purchase such a work at such a price. That will be doing business in a business way, and it will only involve a delay of another year. Then at our next annual meeting, or even prior to that, if enough subscriptions come in to warrant us in proceeding with the work, we can go ahead and do this thing in a rational manner. We have a Council for doing these very things—to go ahead and act and transact the business of this Association. If the Council will say that we have the money, and we can do this work of publication without cramping us or running us into debt, let us go on, I say.

THE SECRETARY: Replying to Mr. Ebert's remarks I will say, that the intention of the Council was to cover the cost of preparation and distribution of this index by the price put upon the book. It was also hoped by the Council that other cities would

follow the example set by a certain Eastern city, which turned over to the Association a balance of $110 left over from its entertainment fund. It was thought that possibly other cities might feel similarly inclined to donate such sums for this very purpose. A committee was appointed last year with Prof. Prescott as chairman to solicit funds for certain extraordinary expenses of the Association. I do not know what the committee has done, but if a few donations of that kind could be made by the cities for publishing the index, the outlay for the Association would be very small. I do not want to discourage the publication, but simply wanted to call attention to the fact that the publication meant the expenditure of a large amount of money. I do not want to discourage it; I want to encourage it, as far as possible.

MR. LOWE: The Association this year is at least $1400 better off than it was last year, by the conversion of some United States bonds into Massachusetts State bonds. That money has been realized and is in the hands of the Treasurer.

THE TREASURER (MR. SHEPPARD): That $1400 is not in cash. It is tied up in the various funds—the Procter Memorial Fund, the Centennial Fund and the Ebert Fund. We have not that much for use, though we are that much richer.

MR. GOOD: I hope the members will pass Mr. Mayo's motion, and then if there is anything further to be said let us have it in proper order.

MR. ELIEL: I want to ask the President if the Treasurer cannot be called upon to make a statement as to the available finances, so we can vote intelligently on this proposition.

MR. GOOD: That does not apply to Mr. Mayo's motion at all.

MR. GORDON: Mr. President, I rise to a point of order. There was a motion before Mr. Mayo's motion that the minutes of the Council be approved as read. That motion was seconded and has never been put to the house.

MR. MAYO: To clear the situation, I withdraw my motion. I am in favor of this index; my motion was *pro forma*.

On motion of Mr. Alpers, the Treasurer was then permitted to make a statement in regard to the finances, and Mr. Sheppard said:

Mr. President, we have an abundance of money in the treasury to pay for the index when it shall come out. During the past year the bonds which constituted the general fund have been called in, and the amount of money received from these bonds has been turned into the Treasury. If it were not for that fact we would not have the money. That money really belongs to the cash in the treasury. My own conviction is, that the position taken by Mr. Eliel is the correct one from a financial standpoint. I believe that, all things considered, the Association is likely to have out of 1000 copies a good many left on its hands, and that our cash will be drawn upon for possibly five to eight hundred dollars: it may be less than that, but I doubt it. My own judgment would be that the position taken by Mr. Ebert, to defer action until we find out by absolute subscription how many will be taken, and thereby determine the number that we ought to print, is the wiser plan from a financial standpoint.

The chair then put the vote upon the motion to approve the minutes of the Council as read by the Secretary of that body, and it was carried.

Mr. Whelpley stated that the Council had referred to the Association

the report of the Committee on George W. Kennedy Resolutions, and asked if he should read them, but the President announced that the time had now come for the selection of a Nominating Committee by States, Territories and Provinces (stating the rules governing in this matter), and declared a recess of ten minutes to enable the members present to select their representatives on the Committee.

After the recess, the Secretary called the roll of the various States, Territories and Provinces, and the Nominating Committee was made up as follows:

NOMINATING COMMITTEE.

Arkansas—W. L. Dewoody.
California—Philip M. Jones, R. G. Shoults.
District of Columbia—L. F. Kebler, F. T. Gordon.
Georgia—R. B. Gilbert, Geo. F. Payne.
Illinois—W. K. Forsyth, Theo. C. Loehr.
Indiana—F. W. Meissner, Leo Eliel.
Iowa—W. J. Teeters, Fletcher Howard.
Kansas—L. E. Sayre, M. Noll.
Kentucky—C. Lewis Diehl.
Maryland—Daniel Base, Chas. E. Dohme.
Massachusetts—S. A. D. Sheppard, J. W. Baird.
Michigan—Wm. H. Burke, W. A. Hall.
Missouri—Wm. Mittelbach, J. M. Good.
Mississippi—O. W. Bethea.
Nebraska—P. B. Myers, C. R. Sherman.
New Jersey—Chas. Holzhauer, G. W. Parisen.
New York—W. C. Anderson, Caswell A. Mayo.
Ohio—G. W. Voss, C. W. Benfield.
Pennsylvania—E. M. Boring, Geo. A. Gorgas.
Texas—E. G. Eberle.
Wisconsin—H. T. Eberle, E. Kettler.
Ontario—J. E. D'Avignon, E. Darby.

The President then appointed the following gentlemen as members-at-large of the nominating committee: A. E. Ebert, Illinois; H. M. Whelpley, Missouri; J. S. Smith, Georgia; W. O. Allison, New York; C. B. Lowe, Pennsylvania.

Mr. Whelpley moved that the 150 applicants for membership whose names had been presented before the recess be now invited to complete their membership in the Association by coming forward after adjournment and signing the Constitution and the By-Laws, their dues having already been paid in full. This motion was seconded by Mr. Dohme and carried.

The Chair stated that the next business in order was the appointment of a Committee on Time and Place of Next Meeting, and he would appoint on that committee Messrs. E. G. Eberle, of Texas (chairman); Otto F. Claus, of Missouri; W. L. Cliffe, of Pennsylvania; J. W. T. Knox, of Michigan, and C. S. N. Hallberg, of Illinois.

After several announcements of committee meetings, etc., Mr. Howard, of Iowa, moved to adjourn until to-morrow (Tuesday) morning, at 10 o'clock, and the motion was put and carried, and the Association stood adjourned to the hour named.

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SECOND SESSION—TUESDAY MORNING, AUGUST 4, 1903.

The second general session was called to order in the casino of the hotel by President Payne at 10:30 o'clock.

The Chair announced that the first order of business would be the reading of the minutes of the first session by the Secretary. The Secretary read the minutes, which, upon motion of Mr. Sheppard, were ordered approved as read.

The Chair then called for the report of the Secretary of the Committee on Membership, and Mr. Whelpley read as follows:

## REPORT OF THE SECRETARY OF THE COMMITTEE ON MEMBERSHIP.

*To the Chairman and Members of the Council of the American Pharmaceutical Association:*

*Gentlemen:* The uncertainty of human life was impressed upon us when the sad news came of the death of George Washington Kennedy, Secretary of the Committee on Membership for twenty-eight consecutive years. In the emergency the Council selected the undersigned to fill the vacancy in office. On February 20, 1903, I received the books, papers and other paraphernalia and assumed the duties so recently laid down by one who had by experience and study perfected himself in the details of office, and who could discharge the duties of the position with the expertness of a second nature. In looking over the records of work since the Philadelphia meeting in September, I found that Mr. Kennedy had every item up to date, and the work shows that he was never too busy to look after the interests of the Association.

In this connection I desire to acknowledge my personal obligations and those of the Association to Mr. R. A. Dentzer, of Pottsville, Pa., who was familiar with Mr. Kennedy's methods of A. Ph. A. work, and who spared neither time nor labor in initiating your new secretary. For myself, I will say that I appreciate the confidence which directed you in calling me to this position, and I ask you to pardon the shortcomings of both judgment and expertness which must be apparent when you compare the work of a novice with that of our late veteran whose voice still rings in our ears—one whose obituary is written in his enduring deeds for the welfare of the A. Ph. A. and recorded in every volume of Proceedings of this Association for almost a generation past.

Immediately after the adjournment of the fiftieth annual meeting, which was held at Philadelphia, Pa., September 8 to 13, 1902, Secretary Kennedy gave the duties of the office his usual prompt attention. He mailed the customary blank forms for completion of membership to each applicant whose name was acted upon favorably at the Golden Jubilee meeting.

Two hundred and eighty-four persons were proposed for membership last year. Of this number, two hundred and seventy-one have completed their membership. Thirteen have thus far failed to pay their annual dues and become members. This is less than five per cent. of those who were officially invited to join, and it testifies to the good judgment of those who proposed the new members. A study of the list of new names shows that the recruits come from the retail drug trade, the ranks of the wholesalers, manufacturers, teachers, chemists, physicians, editors and pharmacists in the government employ. Our Association by new accretions emphasises its broad field of activities. As to geographical distribution, the new members hail from thirty-seven States and territories, Canada and Cuba. Thus the organization is becoming more truly American as time passes. Thus the new membership of the past year represents several more States than ever before.

A revised form of application for membership has been prepared by your Committee in accord with a resolution adopted by the Council last year. The new blank reads as follows:

No.....

# American Pharmaceutical Association.

## Application for Membership.

For Meeting at.....

Approving of the objects of the AMERICAN PHARMACEUTICAL ASSOCIATION, and having read Article I. of its Constitution and Articles I. to VI. of Chapter VII. of the By-Laws (see other side of this sheet), I hereby signify my approval of the same, and subscribe to them. I also enclose the first year's annual contribution, Five Dollars.

Name in *Full** .....

Number and Street .....

Date..... Town and State.....

Recommended by the undersigned two members in good standing:

Name..... Name.....

To be sent to Dr. H. M. Whelpley, Secretary Committee on Membership, A. Ph. A., 2342 Albion Place, St. Louis, Mo.

☞ Members may obtain a certificate of membership (on paper for $5; on parchment, $7.50) from S. A. D. Sheppard, Treasurer A. Ph. A., 1129 Washington Street, Boston, Mass.

Notice of change of address should be given without delay to Charles Caspari, Jr., General Secretary A. Ph. A., 109 Aisquith Street, Baltimore, Md.

Paid.....

* Write legibly or print name.

On the reverse side is printed Article I of the Constitution and Articles I to VI inclusive of Chapter VII of the By-laws.

Chairman L. C. Hopp, of the Committee on Membership, Chairman William Mittelbach, of the Auxiliary Committee, and President Dr. Geo. F. Payne, of the American Pharmaceutical Association, have directed the distribution of over four thousand application blanks since our last meeting. It can scarcely be hoped that we will secure as many new members this year as were elected on the occasion of our Golden Jubilee, but we now have one hundred on the list and will undoubtedly add a satisfactory number before this meeting adjourns.

It is pleasing to note that members are taking an interest in securing new names. The twelve hundred page volume of Proceedings, with its report on the Progress of Pharmacy, is a very convincing argument in favor of joining the Association. With such an aid, each member can add at least one new name, and thus double our membership during the coming year.

Since our last meeting, fifty-four members have been dropped from the roll for non-payment of dues. This is about two-thirds as many as the year previous. Not until human nature is remodeled can we eliminate the "dropped for non-payment" list from our annual reports. It is desirable, however, to reduce the number to a minimum, and Treasurer S. A. D. Sheppard is doing yeoman work in that direction.

The Treasurer informs me that seventy-five members are liable to be dropped from the roll this year for the non-payment of dues. This list will be accessible to all members present at this meeting. I hope you will scan it carefully and see if you cannot save some of the delinquents. The showing is better than one year ago, when eighty-three names were on a similar list. It is to be regretted that the exigencies of life are such that each year some must be stricken from our roll on account of a failure to pay dues for the previous three consecutive years.

REPORT ON MEMBERSHIP FOR YEAR ENDING WITH PUBLICATION OF 1903 PROCEEDINGS.

*Active Membership.*

| | |
|---|---|
| Contributing members in good standing at last report | 1,111 |
| Members added since last report | 283 |
| Total | 1,394 |

*Loss in Active Membership.*

| | | |
|---|---|---|
| By resignation | 33 | |
| By transfer to life membership | 7 | |
| By death | 18 | |
| Dropped from the roll for various reasons | 54 | |
| Total | | 112 |
| Number of active members on roll at this report | | 1,282 |

*Life Membership.*

| | |
|---|---|
| Number on roll at last report | 116 |
| Number added since last report | 7 |
| Total | 123 |

*Loss in Life Membership.*

| | |
|---|---|
| By death | 6 |
| Number of Life Members on roll at this report | 117 |

*Honorary Membership.*

| | |
|---|---|
| Number on roll at last report | 10 |
| Additions | 0 |
| Total | 10 |
| Loss by death | 0 |
| Number on roll at this report | 10 |

*Total Membership.*

| | |
|---|---|
| Contributing members | 1,282 |
| Life members | 117 |
| Honorary members | 10 |
| Total | 1,409 |

After this statement of the numerical condition of our membership, it becomes my duty to approach the saddest bereavement to which life is exposed. I must remind you that death is master of both science and art. Year by year this Association yields to the grim monster who robs us of our best known and most useful members. Persons whose magnetism never lost its charm and whose merit earned the greatest mark of distinction that this organization can bestow. In the hurry of our professional and business lives we are apt to overlook the losses which our calling sustains when a member passes away. Thus it is well that we have placed upon an officer of the Association the duty of collecting the proper data and recording short sketches of the lives of those who go before us. It is also our duty to give assurance of our profound sympathy to all who were near and dear to the departed ones.

While our expressions of regret and professions of sympathy go out in the fullest measure and of the truest kind to all who have been bereaved by the death of an A. Ph. A. member, we must note in particular a few of the oldest members and some who were with us for many meetings and ever active in the service.

Thomas Morris Perot joined in 1857, and was a life member. He belonged to the oldest business firm in America, one that dates back to 1687. Edward Leon Milhau joined the A. Ph. A. in 1858, and was interested in the first pharmaceutical legislation in this country. George White Sloan was continuously active in our Association since his election to membership in 1857. It was a sense of duty to his profession as much as disease which caused his death. Whoever listens to the reading of this report must think of another recently-departed member, and marvel at his resourceful energies exercised in the half thousand obituary sketches which he contributed to our reports. There are times in the affairs of men when words seem inadequate to express our thoughts. This feeling now controls us, and we with one accord bow our heads in silent tribute to the memory of George Washington Kennedy.

The following is a list of deceased members brought to the attention of the Secretary of the Committee on Membership:

| Name. | Address. | Joined. | Died. |
|---|---|---|---|
| Argenti, Jerome John Baptiste, | San Francisco, Cal., | 1893 | Jan. 25, 1903 |
| Barbot, Julian Augustus, | Charleston, S. C., | 1902 | Jan. 28, 1903 |
| Frank, Herman Otto, | Milwaukee, Wis., | 1898 | July 12, 1903 |
| Geddis, Frank, | Washington, D. C., | 1902 | Mar. 14, 1903 |
| Hartshorn, Fred A., | Marlborough, Mass., | 1880 | 1903 |
| Kennedy, George Washington, | Pottsville, Pa., | 1869 | Dec. 22, 1903 |
| Majer, Oscar, | Clinton, Ia., | 1880 | Apr. 12, 1901 |
| McDonald, George, | Kalamazoo, Mich., | 1871 | Apr. 4, 1903 |
| Milhau, Edward Leon, | Brooklyn, N. Y., | 1858 | May 26, 1903 |
| Miller, William Harvey, | New Philadelphia, O., | 1898 | May 17, 1903 |
| Partridge, Charles Kimball, | Augusta, Me., | 1867 | Aug. 26, 1902 |
| Pease, Francis Merrick, | Lee, Mass., | 1880 | 1903 |
| Perot, Thomas Morris, | Philadelphia, Pa., | 1857 | Nov. 15, 1902 |
| Schurk, Louis, | St. Louis, Mo., | 1890 | Mar. 9, 1903 |
| Schlaepfer, John, | Evansville, Ind., | 1879 | May 13, 1903 |
| Shendal, Ernest Emile, | Hot Springs, Ark., | 1891 | Mar. 7, 1903 |
| Sloan, George White, | Indianapolis, Ind., | 1857 | Feb. 15, 1903 |
| Smith, Charles Bradley, | Newark, N. J., | 1868 | Dec. 24, 1902 |
| Sweeny, Robert Ormsby, | Philadelphia, Pa., | 1866 | Dec. 6, 1902 |
| Turner, George H., | Albany, N. Y., | 1880 | Nov. 19, 1902 |
| Turrell, Judson Wade, | Longport, Colo., | 1893 | Nov. 21, 1902 |
| Viallon, Paul Louis, | Bayou Goula, La., | 1870 | July 3, 1903 |
| Wood, Mason Bowen, | Providence, R. I., | 1882 | Apr. 28, 1903 |

*Jerome John Baptiste Argenti*, of San Francisco, Cal., died suddenly at his residence January 25, 1903. Embolism was supposed to have been the cause of death.

Professor Argenti was 41 years of age. He was born in Baltimore, Md., December 5, 1861. He was taken to California when he was not more than three years of age. He was graduated with high honors from St. Mary's College and subsequently entered the University of California. During his college days he gave evidence of ability as a scientist. He distinguished himself in his course in the State University, and when he was graduated he was awarded a gold medal for his work in the department of pharmacy.

Shortly after he received his diploma from the university, and while he was but 22 years of age, he was appointed a professor in the Affiliated Colleges. He was made professor of microscopy when that study was introduced in the colleges. At the time of his death he was professor of Materia Medica, and he also held the chair of botany, which was formerly filled by Professor Behr. It is due in a great measure to his ability and his conscientious devotion to duty that the Affiliated Colleges have attained their present

state of efficiency. He was exceedingly fond of botany, and for a considerable time previous to his death he was engaged during his spare time in giving free instruction on the care of plants and flowers to the gardeners in Golden Gate Park.

Professor Argenti was a life member of the alumni of the University of California, and he always took a deep interest in the affairs of his alma mater. He was also a member of the San Francisco Microscopical Club and a charter member of the California Camera Club. He had the honor of being a president and a director of the Camera Club.

Professor Argenti joined the A. Ph. A. in 1893. In 1897 he married a sister of Dr. T. A. Rottanzi. He leaves two children.

*Julian Augustus Barbot*, of Charleston, S. C., died at his home in that city January 28, 1903. He was born in Charleston, April 27, 1864. He was educated in the College of Charleston.

After graduating in pharmacy at the Medical College of the State of South Carolina in 1884, he entered his father's drug store, and on the death of the latter, in 1897, he succeeded to the business which for many years had been carried on and which, under his good management, continued to be one of the leading pharmacies in this city.

In 1887 he connected himself with the S. C. Pharmaceutical Association, not only as a mere member, but also as a worker. In 1895 he was elected to the office of Secretary and Treasurer and for five years worked hard and faithfully in this capacity. In 1898 he was appointed a member of the S. C. Examining Board, and in May, 1902, was unanimously elected President.

In the midst of the ardent duties appertaining to this office and with much work planned out for the future, he contracted pneumonia and after a few days' illness succumbed to the disease.

Mr. Barbot was a true, honorable man—true to his friends, honorable in all of his thoughts and actions—a man of the highest and noblest type. He joined the A. Ph. A. in 1902.

*Hermann O. Frank*, died at his home in Milwaukee, Wis., July 12. Mr. Frank was born July 17, 1862, was raised and had always made his home in Milwaukee. When eighteen years of age, he attended the University of Michigan, and after a three years' course graduated in the Department of Pharmacy. After returning home he clerked first for Otto Thiele and later for Wright Brothers. He soon opened a store of his own and continued in business until four years ago. After retiring from the drug business, he devoted his energies to a large cigar factory. Mr. Frank was troubled with kidney and heart disease and spent a year at Thomasville, Ga., in an effort to regain his health. He is survived by a widow, three children and four brothers. He joined the Association in 1898 at the meeting in Baltimore.

*Frank Geddis*, of Washington, D. C., died March 14, 1903. Frank Geddis was born in Scranton, Pa., forty-three years ago, being the second son of the late Thomas E. Geddis.

When quite young his parents moved to Bloomsburg, where Frank received his education. About the year 1878 he entered the drug store of the late N. J. Hendershott, under whom he served his apprenticeship, after which he located in Washington, D. C., and was here engaged continuously in his profession, either as clerk or proprietor, until October of last year, when he accepted a position as a superintendent of the Columbia Telephone Company in Philadelphia. His death occurred after a short illness, and was due to a severe case of pneumonia. Frank Geddis was highly respected and much beloved by all who knew him; he was a splendid man and a good pharmacist. He joined the A. Ph. A. in 1902.

*George Washington Kennedy*, of Pottsville, Pa., died of pneumonia December 22, 1902. The news came as a cruel shock to all who knew him. Only a few months previous Mr.

Kennedy was with us, hale and hearty, at the Golden Jubilee of the A. Ph. A., which organization he loved so well and had served so faithfully from the day he joined.

Mr. Kennedy was born in Philadelphia, February 22, 1843, the anniversary of the great American whose name he bore and honored. He was educated in the public schools of that city. After a short experience in Philadelphia drug stores, he enlisted September 15, 1862, in the Thirty-second Pa. Volunteers. He was wounded and sent to a government hospital in Philadelphia, and during convalescence found opportunity to attend his first course in the Philadelphia College of Pharmacy. He re-enlisted July 3, 1863, in the Fifty-first Pennsylvania Volunteer Militia, doing duty in Pennsylvania, and again enlisted January 5, 1864, in the 187th Pa. Regiment, serving as hospital steward, and was mustered out with his regiment August 3, 1865.

During all this time he maintained a very active pharmaceutical correspondence with his friends, ever having in mind an opportunity to finish his college course. After serving as drug clerk in several responsible positions, he was able to fulfill his cherished desire, and with the mark "very satisfactory" graduated with the class of 1869.

His first employment in Pottsville was in Curt Hughes' drug store. Afterwards he removed to Mahanoy City, where he established a drug store which continues a good business. Previous to going to Mahanoy City, however, he spent some time in the South managing a large department store, where he had a score of clerks under his control. From Mahanoy City he returned to Pottsville, and established the business which he continued until his death.

Mr. Kennedy had talents and character which were certain to assert themselves. He was active in many directions, being a member of the First Presbyterian church, Philadelphia College of Pharmacy and Alumni Association, President of the Pottsville Board of School Directors, and Pottsville Athenæum, and connected with the Orphans' Home, Ex-President of the Schuylkill County Druggists' Association, Executive Officer in the 187th Regiment, and prominent in Grand Army, Masonic and Odd Fellows circles. He served with credit two terms in the House of Representatives of Pennsylvania. He was a member of the escort and guard of honor at the funeral of President Lincoln, April 22, 1865. Mr. Kennedy was President of the Pottsville Benevolent Association for many years, and his drug store was practically the headquarters for the society where the poor and distressed sought relief.

Mr. Kennedy's life covered a great deal of history, and practical pharmacy received its share. The records of this Association contain many valuable contributions on the subject from his pen. His name appears in our works of reference in connection with numerous improved formulas and processes of manipulation.

Few men had a wider acquaintanceship in the State or Nation than Mr. Kennedy, and yet he had a peculiar love for the ordinary man—with his work and troubles. While the masses mourned his death, Gov. Stone and other State officials sent telegrams of condolence to the bereaved relatives. The flag on the high school was at half-mast the day of the funeral. The numerous organizations to which Mr. Kennedy belonged all adopted appropriate resolutions. The A. Ph. A. was represented at the funeral.

The thing nearest his heart was to leave with each one of his children, as an inheritance, an education fitting them in a marked degree for work in the world under circumstances very much better than had been his own. The accomplishment of this task had given him intense satisfaction, as he saw its fulfillment.

Mr. Kennedy is survived by his wife and the following children: Surgeon R. M. Kennedy, U. S. N.; Dr. L. T. Kennedy, an attaché of the U. S. quarantine service at Philadelphia; G. M. Kennedy, a student in the electrical engineering department of Lehigh University; and Jennie, wife of J. W. Fox.

The death of George W. Kennedy removes from pharmaceutical circles one of the most prominent figures in the American Pharmaceutical Association during the past gen-

eration. Mr. Kennedy served as Secretary of the Council continuously since 1880. He joined the Association in 1869, and attended his first meeting at St. Louis in 1871. He was always present at the annual gatherings, came early, stayed late, and probably knew more members than any one else in the Association. He was ever faithful to his duties and took an interest in the welfare of the A. Ph. A., which was best realized by those who came in close association with him in the discharge of his official duties.

Any reference to Mr. Kennedy would be incomplete without mention of his special services as secretary of the Committee on Membership. In this position it became his duty to keep a record of the deaths among members, and write the sketches of their lives for publication in the Proceedings. The report was always prefaced with an introduction, which showed that Mr. Kennedy fully appreciated the uncertainties of life and the inevitable end of our earthly existence.

He has said so many beautiful things in an appropriate manner about those who preceeded him in crossing the river of life, that we hesitate when called upon to pay tribute to his memory. A memory so vivid that our mind's eye sees the noble George W. Kennedy, and the mental ear hears his honest voice again saying "we cannot but submit to the will of him who doeth all things well."

Resourceful, indeed, was the man who could prepare the long list of necrologies and annual reports, which Mr. Kennedy submitted in an acceptable and original style. During twenty-eight successive years' service as Secretary of the Committee on Membership he paid eloquent tribute to the memory of 445 deceased members.

This work, as a part of A. Ph. A. history, becomes all the more impressive when we realize that but 137 members died previous to Mr. Kennedy's term of office on the membership committee, and thus failed to receive the tribute to their memories which Mr. Kennedy so touchingly paid to those whose deaths came to his official notice.

The tributes to the memory of George Washington Kennedy will not be confined to this sketch of his life appearing in the volume of Proceedings for 1903, but will be engraven on the memory of every one who has attended an A. Ph. A. meeting during the last thirty-two years.

*Oscar Majer*, of Lyons, Iowa, died at his home April 12, 1901, and was interred in Oakland Cemetery. Mr. Majer was born in Breslau, Germany, January 21, 1848, and absolved the Gymnasium in Breslau, came to America in 1868 and settled in Lyons, Iowa, where he associated himself with his uncle, Leopold Manz, in the drug business. In 1878 he severed his connection with Mr. Manz and came to Clinton, Iowa, where he was engaged as a druggist and chemist up to the time of his death.

Mr. Majer was married in 1891 and leaves a widow and two sons, Hans E. and Robert E.

Mr. Majer joined the A. Ph. A. in 1880.

*George McDonald*, of Kalamazoo, Mich., died at the Phelps' Sanitarium, Battle Creek, Mich., April 4, 1903. He was sick for several months.

Mr. McDonald was born in 1839 in the little village of Ancaster, near Hamilton, Ont. He came to Michigan in 1858 where for several years he acted as drug clerk in the stores of Dr. Babcock and J. P. Clapham. At the close of the Civil War, Mr. McDonald held a responsible position in the drug store of Mr. Lee, at Indianapolis, Ind., after which he went to Cairo, Ill., where he was associated with the P. W. Barclay drug firm.

In 1872 Mr. McDonald entered into partnership with J. P. Clapham and David McDonald, which relationship terminated in 1878, when he established a business of his own. This business Mr. McDonald successfully carried on until the time of his death. He devoted the best energies of a trained and systematic mind, to the practice of his profession, and was always interested in anything that pertained to its welfare.

Mr. McDonald was a member of the State Board of Pharmacy, for four years acting

as president. He was one of the founders of the Michigan Pharmaceutical Association. He attended several meetings of the A. Ph. A., which he joined in 1871. While quiet and unassuming in nature, he was regarded as a useful delegate and worthy representative of his state.

Mr. McDonald was of an exceedingly genial nature, and on account of his kindly disposition and generous heart was very much beloved by all who knew him. A brother, David McDonald, still survives him. He is one of the prominent pharmacists of Kalamazoo. He also had another brother, William, also a well-known pharmacist of that city who died about two years ago; so it might seem that he inherited a liking for the science to which his life was devoted.

Mr. McDonald is survived by a widow and two daughters.

*Edward Leon Milhau*, of Brooklyn, New York, died from pneumonia, May 26, 1903. Mr. Milhau had been in poor health for several years, but his final illness and death were quite sudden.

Mr. Milhau's death removed from Brooklyn, where he had lived for upward of forty years, one of its most representative men and foremost residents, and the drug trade lost one of its oldest, best known and most highly respected members. He was president of the firm of J. Milhau's Sons.

The deceased was born in the old city of New York in 1834. He succeeded to the business of his father nineteen years after entering his father's store, in 1850, and retained active supervision over its affairs until quite recently. Mr. Milhau came from a distinguished French family. His line of descent was unbroken from that of the Viscounts de Milhau. His grandfather, Comte Cæsar Michael de Milhau, who was born in San Domingo in 1762, the son of Comte Henri Jacques Milhau, came to Baltimore, became an American citizen, threw off his title of count, and entered into business. In Baltimore, in 1813, the firm was founded. John Milhau, Count Cæsar's son, continued the establishment, moving to New York in 183c. The original building is still standing, and is now the oldest landmark on lower Broadway, outside the two churches of colonial times —St. Paul's and old Trinity. It was the first store in New York to be flagged with marble, and the first building to have an iron front.

The Milhau family are descended from Bernard, Viscount de Milhau, A. D. 937, in Rouergue, now Aveyron, France. Dr. John Milhau, the deceased's father, was born in Baltimore, in 1796, and died in 1874. He was one of the most distinguished pharmacists of his day. He was the pioneer of the United States drug law of 1846, and joined the American Pharmaceutical Association in 1858. The deceased was a graduate of the College of Pharmacy of New York, and had been in turn trustee and secretary of that institution. He had also been a member of the New York Board of Pharmacy. During the Civil War, Edward Leon Milhau was a private in the Seventh Regiment, National Guard. Mr. Milhau's life was principally a commercial one, though he took a deep interest in antiquarian research, and had collected many works in relation to French families of title. Two sons and two daughters survive him, Mrs. Milhau having died in 1898.

*William Harvey Miller*, of New Philadelphia, Ohio, died at his home, May 17, 1903, after an illness of about two weeks. Mr. Miller was born at Canal Dover, forty-nine years ago. In 1875, his parents moved to New Philadelphia, where his father bought the old Hazlett drug store. The son grew into the business and later became partner with his father, and since the death of the latter has conducted the business himself. Deceased was a good business man and a devoted husband and father. He leaves a wife and two children.

He joined the American Pharmaceutical Association in 1898.

*Charles Kimball Partridge*, of Augusta, Maine, died at his home August 26, 1902.

Mr. Partridge was born in Augusta, December 9, 1836. When 14 years of age he was apprenticed to Eben Fuller, apothecary, beginning thus early the work which, saving a short interval, he continued until his last illness came upon him. After learning the business he entered the wholesale house of W. T. Phillips & Co., at Portland, after establishing and conducting a retail store in the same city. Returning to Augusta he was employed by Charles F. Potter until the outbreak of the Civil War, when he became Chief Clerk of the Adjutant General's office under Gen. J. L. Hodsdon. Here he spent four years in the hardest kind of duty, and bore a great burden of responsibility.

In 1865 Mr. Partridge sustained injuries by falling from a tree, which caused hemorrhage of the lungs and endangered his life. Recovering he went into partnership with his former employer, Mr. Potter, but soon bought him out. September of the same year his store was destroyed in the "great fire," and he occupied one-half of the Wells store until Granite Block was finished in 1866, when he moved in, and never afterward quitted the building except for brief periods after the two other fires which occurred in his premises. In 1874 he and his brother, Frank R., formed the firm of Partridge Brothers, which dissolved in 1887, after which he carried on business alone. At his death he was, and had been for years, in point both of age and service, the oldest druggist in Augusta, and one of the oldest in the State.

Mr. Partridge was a charter member of the Maine Pharmaceutical Association founded in 1877, and its President for several terms. In the same year he was one of the originators of the Maine Commission of Pharmacy. It was largely through his efforts that the existing pharmacy law was passed, and he was a member of the first Board of Examiners. He joined the American Pharmaceutical Association in 1867.

*Francis Merrick Pease*, of Lee, Mass., died at his home in that city after five years illness from progressive paralysis.

Mr. Pease was born in Granville, Mass., learned the drug business with his uncle, Stephen Goddard, in Hartford, and came to Lee and opened a drug store in 1860. The forty years or more as a pharmacist made him one of the veterans in Western Massachusetts. He was President of the Massachusetts State Pharmaceutical Association, having been Vice-President the previous year. He was much interested in the association.

When the Lee Business Men's Association was formed, Mr. Pease was its first president, and was repeatedly elected to that office. In the deliberations of that association, and the many public improvements which they advocated, he took a leading part. He was several times elected chief engineer of the Lee fire district. In 1896 he was elected Master of Evening Star Lodge of Masons, having been Senior Warden during the previous centennial year. Mr. Pease was one of the incorporators of the Berkshire Water Co., and the first manager of the Lee Electric Company.

In social life Mr. Pease was one of the most congenial men, and made and retained a large circle of friends, while his strict integrity won the respect of all.

Mr. Pease was twice married. His first wife was Miss Agnes Griswold, and they had two children, F. R. Pease of this town and Mrs. Wm. Tolman of Pittsfield who survive. Mrs. Pease died in 1893, and in 1896 he married Miss Elizabeth Porter of Stockbridge, who survives him. Mr. Pease's death removes a familiar landmark in the business life of Lee, and he will long be pleasantly remembered. His business sign is the oldest mercantile sign in Lee. Mr. Pease joined the A. Ph. A. in 1880.

*Thomas Morris Perot*, of Philadelphia, Pa., died at his home in that city, November 15, 1902. Mr. Perot was born in Philadelphia, May 8, 1828, of Francis and Mary Elizabeth Perot. He was educated in the city schools, and graduated from the Philadelphia College of Pharmacy in 1849, it being his intention to follow the drug business, in which his people had engaged since his great-grandfather, Christopher Marshall.

He was first apprenticed to Jenks & Ogden, a local firm, and afterwards entered the

employ of Charles Ellis & Co., who occupied the same store, at old 56 Chestnut street, that had been opened by his grandfather, Christopher Marshall, in the early days of the city.

In 1850 he went into business for himself at Fourth and Market streets, and soon took his brother-in-law as a partner to form the firm of T. Morris Perot & Co. Later his business was removed to 621 Market street, where a fire in 1869 totally destroyed it. Then he entered the business with his father, under the name of Francis Perot's Sons Malting Co., the deceased becoming president at his father's death.

This is the oldest business house in America, having descended from the Morris side of the family, and in which the late T. Morris Perot represented the seventh generation of owners in direct descent.

It was founded by Anthony Morris, who came to this country from England shortly before Penn, and stayed at Burlington, N. J. When the city of Philadelphia was founded he established a malting and brewing business, and this was carried on by his descendants of the same name, until early in this century one of the Morrises took an apprentice named Francis Perot, the father of the deceased.

Young Francis, the grandson of the old druggist, Christopher Marshall, as a boy, on his road to bank one day from his father's house, which was next to that of Stephen Girard, fell to gazing at Dawson's brewery and malt house, and became so interested in the business that his father apprenticed him to Morris, there being no room for him in the Dawson establishment.

While learning the business the young apprentice fell in love with pretty Elizabeth Morris, and after marrying her took up the work of her father and continued the ancient firm under the name of Perot. As he grew old he took in his son T. Morris and son-in-law, Edward H. Ogden, under the present name of the firm.

In addition to his duties as head of so large a business, the late T. Morris Perot was identified with many of the public movements in Philadelphia during the last fifty years, and his name was at the head of many an institution of benevolence and education.

For forty-one years he was president of the Mercantile Library, and under his able direction it was increased from 70,000 to 180,000 volumes. Two years ago he resigned from the position on account of ill health and failing eyesight.

For twenty-five years he was president of the Woman's Medical College of Pennsylvania, and was on the Board of Directors at the time of his death. He was also president for many years of the Board of Directors and Trustees of the Philadelphia College of Pharmacy, resigning that position also on account of failing powers.

In addition to these offices he was president of the Pennsylvania Society for the Protection of Children from Cruelty, and of several humane societies, one of which he founded at Oswego, where one of the principal plants of the malting company had been established. His name was actively associated with numerous other associations of a benevolent and educational nature. Mr. Perot joined the A. Ph. A. in 1857 and was a life member.

The deceased is survived by Mrs. Rebecca C. Siter Perot and a son, T. Morris Perot.

*Louis Schurk*, of St. Louis, Mo., died March 9, 1903, after several months' illness. Louis Schurk was born in St. Louis, November 25, 1853. He was educated in the public schools until fifteen years of age, at which time he entered the employ of Dr. Enno Sander, who then conducted a chemical laboratory. From this place he was apprenticed to Habicht, Samensreuther & Langen, who were in business under Barnum's Hotel, at Second and Walnut streets. Mr. Samensreuther, of the firm, furnished the young man with the means necessary to take a course in the St. Louis College of Pharmacy, where he graduated in 1873. On leaving the firm he was presented with a $100.00 bill, as evidence of his employers' appreciation of his good behavior and strict attention to business. He next engaged with Dr. Alois Blank, of 1323 South Broadway, with whom he re-

mained for nine years. From this place he went into business on his own account, purchasing the pharmacy at Thirty-second and Olive streets, where he continued until just previous to his death, or twenty years and four months. Mr. Schurk was one of the founders of the Alumni Association of the college from which he graduated. He served the organization faithfully in various capacities. He was an officer in the college for a number of years, and was corresponding secretary at the time of his death. He joined the American Pharmaceutical Association in 1890, and was chairman of the reception committee for the St. Louis meeting in 1901.

Mr. Schurk had the happy faculty of making friends wherever he became acquainted. He was very attentive to business, and manifested an interest in everything connected with his calling. He was married in 1885 to Miss Mary Stocke, who survives him.

Among the pall-bearers were several A. Ph. A. members.

*Henry John Schlaepfer*, of Evansville, Ind., died of heart disease at his home in that city, May 13, 1903. He had been engaged in the drug business, either as clerk or proprietor, for almost an ordinary lifetime. He was born in Tragen, Canton Appenzell, Switzerland, April 23, 1837, being the youngest of ten children, all of whom have since died. He came to the United States when nine years of age.

Mr. Schlaepfer went to Evansville in 1859, and entered the employ of Noah S. Thompson. In this store he spent his entire business life. Mr. Schlaepfer had been in poor health for two months prior to his death and his demise was not wholly unexpected. He was an active member of the Presbyterian Church, the Indiana Pharmaceutical Association and the American Pharmaceutical Association. He joined the latter organization in 1879.

But it came as sad news to all who knew him, for he was an important factor in business, social and moral affairs of Evansville. His force of character was pointed out as an example to be followed by both old and young.

*Ernest Emile Shendal*, of Hot Springs, Ark., died suddenly from heart failure, March 7, 1903. Mr. Shendal was born in Prussia, Oct. 14, 1847. He emigrated with his parents to this country about 1860 and located at St. Louis, Mo. He learned the drug business in that city and became proprietor of a store on Grand avenue. He was vice-president of the St. Louis College of Pharmacy in 1877. In 1886, he moved to Hot Springs, Ark., where he accepted a position. A few years later he became a partner in the Park Pharmacy, which was established by E. F. Klein, who sold his interest to Mr. Shendal in 1892. In 1896, Mr. Shendal disposed of this store to Eisele & Hunt and became associated with J. W. Angle, in the firm of Shendal & Angle, buying out J. A. Livers & Co. In 1899, Mr. Shendal withdrew from the firm and purchased an interest in the Eastman Pharmacy with R. G. Davis. He bought out Mr. Davis in 1901 and continued as proprietor until the time of his death.

Mr. Shendal was particularly noted for his kind and considerate disposition, his integrity and honorable dealings. He was president of the Arkansas Association of Pharmacists in 1891 and 1892.

He joined the American Pharmaceutical Association in 1891, and the organization was represented by Ernest Frederick Klein as one of the pall bearers.

*George White Sloan*, of Indianapolis, Ind., died at his home, February 15, 1903. Dr. Sloan was born in the city of Harrisburg, Pa., 1835, coming with his parents to Indianapolis in 1837. Attended the first public school of Marion county and subsequently the Marion Seminary of fifty years ago, when Indianapolis was a town of 10,000 inhabitants. When thirteen years of age, he entered the drug store of his uncle, David Craighead, which was located only a short distance from Mr. Sloan's present store on Washington street. In 1850, Mr. Craighead took in partnership Mr. Robert Browning, and when

Dr. Sloan's uncle died, he was taken into the firm and it became the well-known house of Browning & Sloan, and was one of the prominent business firms of the city of Indianapolis until 1886, when it was discontinued and Mr. Sloan organized the present firm known as the Sloan Drug Co.

The span of life of Dr. Sloan is an unusual one; when he first entered the drug business there were but three other stores besides that of his uncle, and to have been actively engaged for fifty-five years in one location in so changeable a city as that of Indianapolis, is an unequaled career. The professional reputation of Dr. Sloan is a national one, he was a student of the Philadelphia College of Pharmacy, was associated as an assistant with Prof. Edward Parrish, an active and life member of the A. Ph. A. since 1857, and its president in 1879. He was one of the founders of the Indiana State Pharmaceutical Association, occupying important positions of officer and active worker up to date. He was a member of the Indiana State Board of Pharmacy, of which he was the first president and at the time of his death its secretary.

He was at the time of his death a member of the Board of Trustees of the United States Pharmacopœial Convention, president of the Indianapolis School Board, president of the Board of Trade, a member of the George H. Thomas Post, G. A. R., a member of the Loyal Legion, and in all a public-spirited citizen and a good man.

Dr. Sloan received his degree from the Indiana Medical College, of which for many years he was the lecturer on pharmacy. Purdue University bestowed upon him, in recognition of his services to pharmacy, the honorary degree of Doctor of Pharmacy. Dr. Sloan was married in 1867 to Miss Caroline Bacon, who, with three children, George B., Frank T. and Mary A. Sloan, survive him.

The funeral took place on Tuesday, February 17th, services being held in Christ Church, of which he has been a vestryman for thirty years. The Masonic fraternity, of which he was a thirty-third-degree member, took charge of the funeral. The pharmaceutical profession was represented by a delegation from the Indiana Pharmaceutical Association, Indiana State Board of Pharmacy, the A. Ph. A. being represented by Prof. John U. Lloyd, of Cincinnati, O., and Prof. John N. Hurty and Josiah K. Lilly, of Indianapolis, Ind. The Board of Trustees of the United States Pharmacopœial Convention was represented by Albert E. Ebert, of Chicago, Ill.

*Charles Bradley Smith*, of Newark, N. J., died at his home December 24, 1902, after ten days' illness.

Mr. Smith was born in Lackawanna, Pa., April 10, 1841, and went to Newark when he was ten years old. With the exception of a few years, in which he resided in New York, he made his home in Newark, taking an active interest in the development of the city and all that tended to the progress of the municipality. He started in the drug business as a clerk in the employ of C. W. Badger, and attended the New York College of Pharmacy, from which institution he was graduated in 1863. He was for a time connected with the firm of Tarrant & Co., in New York, but left that position when he purchased a half interest in the business of Mr. Badger, at Newark.

Later, he bought out his former employer, and since that time he has continued the business in the same place where he began as clerk. During his business career he had several partners. The concern was incorporated as C. B. Smith & Co., in 1891, and he was chosen President of the company, in which capacity he had continued since.

Mr. Smith had been connected with the Universalist Church of the Redeemer during the entire period of his residence in Newark, and was president of the parish, a member of the the board of trustees, and, for more than a quarter of a century, superintendent of the Sunday-school. He was an active member of the Newark Board of Trade, a member of Newark Lodge No. 7, F. and A. M., and was widely known in Masonic circles. Mr. Smith was for many years secretary of the Bureau of Associated Charities, and was also a director of the old Second National Bank. Mr. Smith spent a very active life, and

one which caused the pastor of his parish to preach a sermon on his work with "the upright man" as a text. Mr. Smith joined the A. Ph. A. in 1868.

*Robert Ormsby Sweeny*, of Duluth, Minn., died at East Duluth, September 6, 1902. He was born in Philadelphia, Pa., in 1830, and went to Duluth in 1852. Dr. Sweeny was possessed of considerable artistic talent, and he was the designer of the present great seal of the State of Minnesota. He was deeply interested in the propagation of fish, and was the first fish commissioner of his adopted State. He was chief of the United States fish hatchery at East Duluth for several years, and for the latter part of his life was in the retail drug business at the last named place. He was a clever sketch artist and wrote many short articles which he illustrated. His caricatures on various subjects of public occurrence attracted wide attention. Dr. Sweeny practiced medicine much of the time.

Dr. Sweeny joined the A. Ph. A. in 1866, and was a life member. He was buried in St. Paul.

*George Heather Turner*, of Albany, N. Y., died at his home November 19, 1902. He was born in Armadale, England, and came to this country when ten years of age. The family located in Albany, N. Y. His father, James H. Turner, established a drug business in 1850, which in 1869 was moved across the street. The new location has been continued until the present time.

George H. Turner became the senior member after the death of his father, and the business now goes to the next younger brother, who will continue it in the same location.

Mr. Turner was an exemplary business man, and loyal to every trust reposed in him. He joined the A. Ph. A. in 1880.

*Judson Wade Turrell*, of Longport, Col., died at his home in that city November 21, 1902, of angina pectoris. He was born at Forest Lake, Susquehanna Co., Pa., Aug. 26, 1843. His early life was spent on a farm until 15 years of age, when he attended Montrose Normal School, Montrose, Pa.

August 5, 1862, he enlisted in the 13th Pennsylvania V. C. at Philadelphia, and served until taken sick, and then returned to Montrose, where he clerked in his uncle's store for the succeeding two years.

In the fall of 1866 he went overland to Colorado and located at Burlington, Boulder Co.; then in 1867 he went to Cheyenne, Wyo., and embarked in the drug business, selling out in 1869 and returned to Burlington.

When Longport was started he removed thither, and continued in the drug business until 1879 when his store burned out. This he rebuilt, and opened a new drug, stationery and jewelry store, and continued at the same location until his death.

Mr. Turrell was elected in 1893 President of the Colorado State Pharmaceutical Association, and was a member of the 6th General Assembly of the State of Colorado. He joined the A. Ph. A. in 1893.

*Paul Louis Viallon*, of Bayou Goula, La., died at his home, July 3, 1903. Mr. Viallon was born in St. John Parish, La., in 1842. In 1856 he removed with his parents to New Orleans. His education was begun in the St. Joseph's College, of Bardstown, Ky.. and continued in Audubon College, New Orleans. It was in 1870 that Mr. Viallon, then a young man, removed to Bayou Goula. He immediately entered the drug business and remained in it continuously until the day of his death. His first training had been in New Orleans, in the employ of C. K. Finlay, and in his new field of work he carried with him the successful methods of his former employer.

In Bayou Goula, Mr. Viallon soon took rank as one of the leading citizens. His generous and kindly disposition made for him a host of friends and the strict integrity of his life retained for him the respect of all who ever knew him.

In everything tending to help the pharmacists of the State Mr. Viallon was especially

prominent. He was one of the oldest members of the Louisiana Pharmaceutical Association, and attended its meetings with a regularity which put to shame the punctuality of the younger members. In 1896 he was chosen president of the Association, and so efficient and unselfish was his labor that the Association honored him later with a re-election. He was then appointed by the Governor a member of the Louisiana Board of Pharmacy, and by the Board was given the office of President, a position he held at the time of his death.

Mr. Viallon was a charter member of the Iberville Lodge of the Knights of Pythias. He had held the offices of District Deputy, Grand Chancellor and Grand Lodge Representative in this order.

Mr. Viallon left three sons and three daughters. L. H. Viallon is a prominent physician; P. L. Viallon, Jr., is a prominent druggist of Whitecastle, and in 1902, President of the Louisiana Pharmaceutical Association, and another son is a successful dentist. Mr. Viallon was a life member of the American Pharmaceutical Association, which he joined in 1870.

*Mason Bowen Wood*, of Providence, R. I., died at his home in East Providence, April 28, 1903, after a two-months' illness.

He was born in Coventry, October 23, 1846, and was the oldest son of John Olney and Elizabeth Browning Wood. He received his education in the schools of the town and from private tutors. He entered the drug store of Byron Smith, on North Main street, Providence, August, 1863, and later opened the drug store on South Main, corner of Transit street, in partnership with William H. Hinds, under the name of Wood & Hinds, and continued there a number of years, until failing health caused him to withdraw from the firm.

He then entered the jewelry business with the late Charles Fairbrother, under the name of Fairbrother & Wood, and continued until failing health caused him to leave the East and go West in search of a different climate. He journeyed as far as Portland, Ore., where he regained his health and became manager of the retail department in the drug store of Hodge, Snell & Co. There he formed many friendships.

He was superintendent of the First Baptist Sunday-school of Portland. Before going West he was superintendent of the Second Baptist Sunday-school of East Providence. On his return from the West he opened a drug store in Watchemoket Square, East Providence, which he maintained for the past twenty-five years. He was President of the Rhode Island Pharmaceutical Association for eight years, and declined re-election the ninth time, when he was presented with a gold-mounted ebony gavel, suitably inscribed.

He was Health Officer of the town of East Providence for thirteen consecutive years, and gave universal satisfaction. He was Overseer of the Poor of the town of East Providence for the past eight years. He was Past Master of Rising Sun Lodge, No. 30, A. F. and A. M.; also King of Providence Royal Arch Chapter, and a member of Naomi Chapter, No. 8, O. E. S. Mr. Wood joined the A. Ph. A. in 1882.

He leaves a widow, a daughter and a son, also a brother, Everett J. Wood, of Providence. His life was characterized by many admirable qualities, prominent among them being his charitable kindness to all, not only those of his own social standing, but the poor and downtrodden were ever subjects of notice to him. The children, too, will miss him on the street; he always had a word for them.

I desire to make use of this opportunity to thank the officers and members, who have uniformly assisted me in securing the information required for the preparation of sketches of deceased members.

Respectfully submitted,

H. M. Whelpley, *Secretary of Committee on Membership.*

Mr. Lowe, of Philadelphia, seconded by Mr. Dohme, of Baltimore, moved that the report just read be received and referred to the Committee on Publication. Mr. Hallberg, of Chicago, moved to amend to the extent that a standing vote on the report be had, in honor of the memory of George W. Kennedy, late Secretary of the Committee on Membership and late Secretary of the Council, and the motion, as amended, was carried by a unanimous rising vote.

The Chair announced that the hour of 11 o'clock had now been reached, which was set as a special order to hear the report of the Joint Investigating Committee of the American Pharmaceutical Association and American Medical Association upon the proposed National Bureau of Medicines and Foods, and called for that report from the Chairman.

Mr. Whelpley moved that by common consent the report of the Nominating Committee be made and acted on previous to the special order, as it would take but a few minutes, and the motion was seconded by Mr. Ebert and carried. Mr. Whelpley then read the report, as follows:

## REPORT OF THE NOMINATING COMMITTEE.

The Nominating Committee desires to submit for your consideration the following candidates for office for the ensuing year:

*For President*—Lewis C. Hopp, Cleveland, O.

*For First Vice-President*—Wm. C. Alpers, New York.

*For Second Vice-President*—A. M. Roehrig, United States Public Health and Marine Hospital Service, Philadelphia.

*For Third Vice-President*—Otto F. Claus, St. Louis.

*For Treasurer*—S. A. D. Sheppard, Boston.

*For Secretary*—Charles Caspari, Jr., Baltimore.

*For Reporter on Progress of Pharmacy*—C. Lewis Diehl, Louisville.

*For Members of the Council for Three Years*—Leo Eliel, South Bend, Ind.; George F. Payne, Atlanta, Ga., and E. G. Eberle, Dallas, Texas.

H. M. WHELPLEY, *Secretary of the Committee.*

The Chair invited action on the report, and Mr. Good, of St. Louis, moved that the Secretary cast the affirmative ballot of the Association for Mr. Lewis C. Hopp, of Cleveland, for President. Mr. Dohme seconded the motion and it was carried. The Secretary announced that he had deposited the ballot of the Association as instructed, and the Chair declared Mr. Hopp duly elected as President of the American Pharmaceutical Association for the ensuing year.

Mr. Parisen, of New Jersey, then moved that the Secretary cast the like ballot of the Association for Mr. William C. Alpers, of New York, for First Vice-President, which motion was seconded by Mr. Lowe and carried. The Secretary announced that he had cast the ballot, and the Chair declared Mr. Alpers elected First Vice-President for the ensuing year.

Mr. Ryan, of Detroit, moved that the Secretary cast the ballot of the Association for the remaining officers proposed by the Nominating Com-

mittee, which motion was seconded by Mr. Dewoody, of Arkansas. The Chair suggested that it might be embarrassing to the Secretary to vote for himself for office, and proposed the Secretary of the Council as a substitute in this behalf. Mr. Ryan accepted the amendment, and the motion was so put and carried. Mr. Whelpley, Secretary of the Council, announced that he had cast the ballot as directed, and the Chair declared the balance of the ticket proposed by the Nominating Committee duly elected to the various offices set opposite their names.

Mr. Whelpley presented a list of fifteen applicants for membership approved by the Council. The names were ordered posted for inspection under the rule.

THE PRESIDENT: It is now in order for the Association to receive the report of the committee, which has this hour as a special order to-day. Mr. H. H. Rusby, of New York, is chairman of that committee—the Joint Investigating Committee of the American Pharmaceutical Association and the American Medical Association upon the proposed National Bureau of Medicines and Foods. We will now hear from Mr. Rusby.

Mr. Rusby then addressed the Association as follows:

*Mr. President, Ladies and Gentlemen:* It seemed to your committee desirable that the resolutions they had adopted should be read first in their entirety, and then taken up *seriatim* and discussed.

Mr. Rusby then read the two paragraphs of the preamble of the report and the first two resolutions, the text of the report being as follows:

## REPORT OF THE JOINT INVESTIGATING COMMITTEE OF THE AMERICAN MEDICAL AND THE AMERICAN PHARMACEUTICAL ASSOCIATIONS ON THE PROPOSED NATIONAL BUREAU OF MEDICINES AND FOODS.

*Whereas*, The foods and medicines supplied in the United States do not so uniformly agree with proper standards of purity, quality and strength as they should; and,

*Whereas*, A degree of distrust and want of confidence concerning the quality of such foods and medicines prevails to a discouraging extent; therefore, it is,

*Resolved*, That a more perfectly organized system for remedying the above-mentioned conditions than that now existing should be devised and put into operation; and,

*Resolved*, That the A. Ph. A. and the A. M. A., acting in harmony with the United States government authorities, constitute the most complete and trustworthy means for attaining the objects named; and,

*Resolved*, That the A. Ph. A. shall coöperate to this end with the above-mentioned institutions, provided that a plan be devised satisfactory to those institutions, and that the committee of this Association be continued and instructed to report to the Council. In the event that a plan satisfactory to the Council of this Association be reported to them previous to the next meeting of this Association, said Council shall be authorized to elect from the members of the A. Ph. A., a board of directors consisting of five members, to act with a similar Board, in the event of its appointment by the A. M. A., and with the United States government authorities in the establishment of a National Bureau of Medicines and Foods; and this Council shall, immediately after the election of such Board, report the same to the President of the A. M. A.

*Resolved*, That in carrying out these resolutions the following general principles shall be adhered to:

(1) That neither this committee nor the proposed Board of Directors shall have authority to draw upon any funds of the A. Ph. A.

(2) That the methods employed for attaining the objects stated above may include commendation of worthy products or condemnation of unworthy ones, or both, provided that said methods of condemnation do not in any way involve the A. Ph. A. in legal responsibility.

(3) That nothing to be undertaken by such Bureau shall be in conflict with the spirit of the U. S. Pharmacopœia or with the U. S. Government authorities.

(4) That the operations of the proposed Bureau shall be free from any attempt to secure financial profit for any of the institutions named herein or for any of their members or agents; but said Bureau is authorized to employ proper means for securing the funds necessary to defray its legitimate expenses.

For the Committee.

H. H. RUSBY, *Chairman.*

The chairman of the committee then re-read the first paragraph of the preamble, and said:

I presume it is not necessary to say anything in support of that statement. We have, during the four months in which we have been engaged in seeking information, gone to all classes represented. We have issued special letters to the retail pharmacists, the manufacturing houses and the physicians, and so far we have not found an individual or association that denies that the foods and medicines supplied in the United States do not so uniformly agree with proper standards as they should—whether imported or manufactured here. If you wish any discussion of that proposition, we have a bushel of authorities which we can bring forward to substantiate the claim. I do not think it will be necessary, however.

Mr. Rusby re-read the second paragraph of the preamble, and continued:

If you doubt this, I will say that we found a great number of physicians who are dispensing their own medicines because of lack of confidence—want of confidence on the part of the people in the pharmacists and want of confidence on the part of the pharmacists in the manufacturing houses, also want of confidence by the physicians in both the pharmacists and the manufacturing houses. Everywhere we find distrust. The committees on adulteration of the different State associations, medical, pharmaceutical and the like, have, year after year, contributed their reports showing the extent of adulteration of goods. Now I am perfectly free to acknowledge that many manufacturing houses do all in their power to put out good articles, but poor articles do get into commerce, nevertheless. The extent and effects are exaggerated, and a degree of distrust is created even greater than is warranted by the facts.

We have heard a great deal lately in the newspapers about these matters, and it would seem that the principal difficulty under which the retail pharmacists labor to-day is a want of trust and confidence. The physician will not trust the retail pharmacist to select his own article. One tells him that he must dispense A B's preparations, while the one in the next block tells him that he must dispense C D's; and the poor pharmacist must keep all these makes of the same article on his shelves or resort to substitution, or else he must suffer loss of business. This is the condition that exists. The average physician knows little more *materia medica* than the lawyer or merchant, unless he has had special

training. He recognizes that he is not qualified in that respect, yet he ventures upon dispensing rather than trust the pharmacist.

Now if these things are true, then there is nothing thus far in our report that anybody can take exception to; it is no visionary statement, but simply a statement of facts. A better system than that now existing should be devised. If you do not believe in the committee's views as to the best system to be adopted, you need not adopt its recommendation in that regard, but you should adopt part of this report, up to this point, at least, that a better system "should be devised and put into operation," and that "the American Pharmaceutical Association and the American Medical Association, acting in harmony with the United States Government authorities, constitute the most competent and trustworthy means for attaining the object named" The plan for thus accomplishing the purpose named has been worked out chiefly by my associate, Dr. Philip M. Jones, whom I shall have great pleasure in introducing to you after a while. He has worked with the medical people and with the United States Government authorities, and he will have something to tell you about that branch of the work. We are able to do certain kinds of work which the Government cannot do, yet which it is necessary should be done in order that their work shall be effective. So I say that we together "constitute the most important and trustworthy means for attaining the object named." If we are not competent and trustworthy, these two national associations of ours and the United States Government working together, where can you find any means that are?

We asked the head of one of the large manufacturing houses whether the condition depicted was true, and he said it was true. and he was sorry for it. We asked him about the remedy for it, and he said with the utmost earnestness: "The thing for you to do is to have everybody buy their goods of us!" [Laughter.] After a day or two I met another one, and he said we must buy all of our goods of *him*. It is evident that relief is not to be had by trusting wholly to commercialism.

Now, if it is true that these conditions do exist, that they should be improved, that the American Pharmaceutical Association and the American Medical Association, acting with the United States Government authorities constitute the best means for improving them, then we say, "Resolved, that the American Pharmaceutical Association shall coöperate to this end with the above mentioned institutions, provided that a plan be devised satisfactory to all, and that the committee of this Association be continued and instructed to report to the Council," etc. Now, this committee has only existed for about four months for the study of this which I believe to be the most important undertaking that was ever attempted by the American Pharmaceutical Association. If I had all day I think I could talk continuously on the subject without exhausting even its important features. This has been a very fruitful four months of work on our part. The members of the committee have accumulated an enormous amount of information on the subject, and have ideas in regard to it which are very far-reaching, but it is impossible to get into all these matters to-day. Still less has it been possible for your committee, in this short period, to settle all the important questions which have come before it. We have agreed on some things and on some we have not. Some things we have not seen so clearly as to be able to report upon them. We have tried to make sure of every point before recommending it. Hence it is that we have not been able to agree upon recommending the adoption of the plan, of which copies have been distributed among you, and which I shall discuss later.

Now, for a little history in regard to the American Medical Association. Early in the present year that Association, through its President, who, I believe, was instructed by its house of delegates, appointed a committee of five, similar to your own committee, and that committee was instructed to investigate the desirability and the practicability of establishing such a Board as a Bureau of Drug and Food Control, and to report to the American Medical Association at its meeting in May. They did so, and reported favor-

ably, but the Association could not authorize the election of a board of directors for the purpose of carrying on the work, because they did not know what our Association would do. Unless they knew positively that this Association would also elect a board of directors, it was useless for them to do so. So all they could do was to continue their committee until they ascertained what we would do. They will meet again before we do, and if this Association does not elect its board of directors, then that Association will again meet without knowing how to act, and so it will go on from year to year. There must be some provision for action if we are to do anything at all. If our board of directors is established previous to the next meeting of the American Medical Association, then they will elect their board, and we will work together.

Now there is only one way in which the object sought can be practically accomplished, and that is for this Association to leave the approval of any plan devised by this committee to its Council. When the Council shall be satisfied that the plan is satisfactory, let them elect a board of directors temporarily, until the next meeting of the Association, when it may take action by continuing the board or electing a new one. Then, by notifying the president of the American Medical Association of the fact, the latter society will be in a position to elect a board, and the work can go on along parallel lines, so far as organization is concerned.

Now, if these propositions are agreed to, then we say: "Resolved, that in carrying out these resolutions the following general principles shall be adhered to," etc. That is the place where we began to have trouble, Mr. President. Up to that point we had none. You know that what is to the interest of one is not always to the interest of the other. We found that the manufacturing houses could not agree with us on some important points. Of course, I do not wish to say a word against the motive which actuates these houses, but they are in business to make money, and that is, so far as their business is concerned, the only object that they have. They regard themselves as machines for grinding out money, and every man employed, and every measure adopted, is but a cog in the money-making machine. But this Association takes no such view as that. It does not exist for any such purpose, but for the advancement of the interests of American pharmacy; and while it is our duty to consider the interest of the manufacturer, it is not our duty to withdraw from any position that we have assumed if we see that it is clearly to the interest of the great masses of physicians, pharmacists and patients, merely because it involves some trouble or difficulty, or even loss, to the manufacturer. I do not say these things to precipitate any unpleasant discussion, because many of these people are among my best personal friends, and men whom I esteem; and some of them have talked with me most kindly on this subject. But we must view the situation confronting us from our conception of what is right, whereas the manufacturing houses generally view it from a cold business standpoint, however philanthropic their representatives may be as individuals. I only want to say just enough on this somewhat unpleasant subject to advise you as to the position in which the committee finds itself. The committee published a plan and issued a circular letter to the manufacturing houses, and asked them to criticise the plan. We issued similar communications to the retail pharmacists. We have not sought to avoid criticism; we have invited it. We wanted adverse criticism, so that we ourselves might not be led into error. We have not been visionary; we have realized the heavy responsibility resting on us. Personally, I would rather have a millstone hanged about my neck and be cast into that lake which lies before these doors than to do anything to the disadvantage of the American Pharmaceutical Association. But your committee is impressed by the fact that during this period there has not been a single criticism advanced by anybody that had not been foreseen and discussed by us. More than three-fourths of all the criticisms which have been brought to our attention have been criticisms of things supposed to be comprehended by our plan, but not so, or matters supposed to have been omitted, but actually incorporated in the plan.

One critic said his objection to the plan was, that it took too much money out of the treasury of the American Pharmaceutical Association; whereas the plan specifically provides that none shall be so taken. Another does not approve of blanket certificates; whereas the plan reads, "No blanket certificates shall be issued." Others criticised the plan because they thought it did not contain certain provisions, and we would write back and say, "You will find exactly that provision in such a clause."

Now I want to call your attention to a few of the provisions of the plan which have been most misunderstood. In the first place there shall be no expense incurred by the American Pharmaceutical Association. In the second place there shall be no wording of any contract or report in such a way that this Association shall be involved in any consequences for the act. Thirdly, no blanket certificates are to be issued. Certificates would be issued in the following manner: We should have different classes of members. Members of the American Medical Association and American Pharmaceutical Association should, by virtue of their membership in these associations, constitute one class, while the manufacturing houses should represent a membership of a different class. The manufacturing houses make individual contracts with the Bureau to do certain things, under penalty of prosecution for breach of contract and fraud if they fail to do so. These proposed forms of contract have been submitted to the highest authority, in order to be sure that they are legal. The general purpose of our arrangements with the manufacturers is to have them submit samples of their products to us for examination. The general purpose of our arrangement with the physician and pharmacist class of members is to make known to them which lots of the manufacturers' products thus examined are up to the required standard. Let us take extract of opium as an illustration. To begin with, the Bureau enables the manufacturer to procure, without trouble or expense to himself, opium bearing the Bureau's certificate that it contains a certain percentage of morphine. Let us suppose that he makes from this 1,000 pounds of extract. He is then required to send us, in connection with a sample of that lot, his own assurance that it fully represents the entire lot, and that the lot contains so much extract of such a value He is then at once assessed on a percentage basis of the value of the lot. If we find upon examination that the goods are up to the required standard, then the manufacturer is authorized to print on the label of every package the following certificate—something of this kind: This is to certify that this package of extract of opium, Manufacturer's No. so and so, Bureau No. so and so, has been examined and found to be so and so. Suppose, however, that we find it is not up to the standard; then the manufacturer pays the same as though it were up to the standard. There is thus no temptation anywhere to give a certificate that the manufacturer is not entitled to. The man who makes the assay and determines the quality of that particular batch of extract does not know whose extract it is, and it would seem that that fact alone would preclude the possibility of corrupt collusion. But we do not depend on that. We have a carefully framed set of provisions for detecting any crooked work. This shows you, then, one means for securing the funds necessary to carry on the work of the proposed Bureau, and the amount of money pledged to us on this basis amounts to from $120,000 to $150,000 annually. I mean to say that on the basis of one per cent. of the value of the trade promised to us our prospective revenue amounts to that sum. When goods are found deficient the maker alone is informed of that fact. He is refused a certificate for that lot, but has an opportunity of correcting the deficiency, and his reputation is not injured.

Now there is another plan—that proposed by the manufacturers. Many of them say that their reputation is so good that no certificate issued by the associations concerned could improve it, and therefore our plan could not assist them in any way. To this I reply: "Why, in that case, does not each one of them supply all the goods that are used? If the reputation of any one of them is perfect, why do some purchasers prefer to go elsewhere, and why is there room for any choice between them?" Mr. President,

it is not true. No manufacturer enjoys a reputation as good as that of these two national associations, and no product issued by him could fail to be received with greater confidence if it bore the certificate of the proposed Bureau. I wish to say right here that I am not indulging in any sarcasm in regard to these manufacturers. I believe many, if not most, of them are taking every means possible to keep their articles up to the standard. I want to disclaim any intention of depreciating them or their products. I have the highest respect for these people. But they take a different view from ours, and we shall have to do the same with them. Their plan is this: Go into the open market, buy goods all over the country and examine them. Then, if we find an opium extract, for example, that contains less morphine than it should, publish the fact in all the journals, giving the name of the manufacturer. Now, in the first place, the manufacturer might have made a mistake. Such mistakes are continually coming to my attention—mistakes that the best of them make; they cannot help it; it is human to err. But they would never recover from such a publication as is proposed, and the results would be most unjust. Then suppose that we made a mistake, what would happen to us? Or, even suppose we had not, but that they believed we had, what would be their attitude? Furthermore, the relations between the journals and the manufacturers are such that the former would generally refuse to print any such adverse criticisms. Again, where are the funds to come from to support an institution so conducted? Will the American Pharmaceutical Association support a board of experts out of its treasury? Or will they defend the innumerable lawsuits resulting. Their funds would be absolutely exhausted at the end of the first year. I will tell you what the manufacturers say in reply: "We will pledge you that $50,000 will be contributed annually by the reputable manufacturers to support a Bureau that will publish such condemnations." Now I really believe that the reputable manufacturers are just as much interested in this matter, and just as anxious to see the desired result attained, as this Association, and they are willing to aid us in thus subscribing to the support of the Bureau. But suppose it becomes necessary for the Bureau to report adversely upon the product of one of them. Would he not at once say: "Do you expect us to continue subscribing to a Bureau that condemns our products? We are contributing $5000 a year now, but we give no more after this year." That is what they would say; that is human nature. When a bureau of this sort is supported by contributions of that kind you have the door open, if not for actual corruption, at least for coercion, and widespread suspicion of its operations must inevitably result.

That, then, represents the two great plans before us. The pledges announced for both are made by parties fully able to do what they promise, and they say they will raise the necessary amount of money if we will adopt this plan or that. Therefore, you may consider the respective prospects as to the revenue of the two.

Now, how will our plan work? Dr. Wiley, Chief Chemist of the Department of Agriculture, tells us that the United States Government has been trying for a generation to do just what we propose to do, but that it has failed and given up. "But," he says, "there is another kind of work which we can accomplish, that it is our proper business to accomplish, and the work that you propose to do will assist us, and our work will assist you." Dr. Wiley has not endorsed the details of this plan—he has not fully examined them as yet—but he has expressed the hope that this Association will establish such a bureau in connection with the American Medical Association, and that we will work in harmony with the United States Department of Agriculture.

It must be remembered that it is not the intention that the Bureau shall attempt the handling of all, nor even of many, articles. Most of the larger manufacturers list from 5,000 to 10,000 articles. The Bureau proposes to handle not more than one per cent. of these. Selection would be based partly upon the importance of the articles, the important standard things, mostly of the U. S. P., being taken up; also upon the readiness

with which the articles lend themselves to tests for the determination of their quality. Again, we should select such as were especially likely to be of poor quality, and so most in need of certification. For example, we have reason to believe that sulphate of quinine, contained in the original sealed packages of reputable makers, is almost uniformly up to standard. In that case, it would be a waste of energy to spend much time upon that, but we know that there are commonly found in the market packages of 2-grain sulphate of quinine pills which do not contain the full two grains. These might well be required to be certified as to weight and quality. There remains, in the other 99 per cent. of articles of the manufacturer, plenty of room for the exercise of his energy and ambition, even in the direction of befogging and misleading the public in regard to facts, if he chooses to do so. If the success of this plan should be such as to commend itself to all concerned, then the list might be gradually extended, subject to the approval of all interested.

What we want is to make it possible for the physician to prescribe more and more the standard preparations, and not to be compelled to specifiy; we want to get rid of this unfortunate necessity. But one house says the plan is not to be permitted to go through, because it would levelize all the products of manufacture. What, in Heaven's name, does the Pharmacopœia exist for but to levelize them. Other firms say practically this: "We have spent hundreds of thousands of dollars in persuading the public that the preparations of our competitors are not so good as ours, and after we have spent so much money in establishing this prestige we propose to reap the benefit. If the American Pharmaceutical Association takes this step, it will reveal the fact that many of these goods are identical in quality with our own, and that will interfere with our process of deception." That is what we run up against; that is cold-blooded business for you! Now, we believe that different methods should prevail—that the truth should prevail; that the physician should be able to prescribe an article and be sure that he gets just what he wants, without having to specify the maker.

Now, I have been compelled to say these things here, on account of the position I am in as the agent of the Association, so to speak, because they appealed to the conscience of the committee; but I want to say again that we do not desire to interfere with the rights of the manufacturers; it is not the object of our plan to deprive the manufacturer of any right which he possesses in the interest of the retail pharmacist. Many have asked me, "Where does the retail pharmacist and his manufactures come in, in your plan?" I can at this time reply only that the retail pharmacist has been provided for, but that this Bureau does not propose to attempt putting him on a plane of commercial equality with the large manufacturer. That would be contrary to the natural laws of trade. Large capital, wide experience, employees of great ability, give natural advantages against which the small manufacturer—the retail pharmacist—must struggle as best he can. The Bureau could not if it would, and would not if it could, attempt to interfere in the interest of the more poorly equipped class. It is our aim to protect him against certain misuses of these advantages by the larger concerns, which weigh him down, exhaust his resources, and leave him without his just proportion of the proceeds of the business. The Bureau is, in reality, an institution designed to protect and assist the retail pharmacist, but, as stated, it must do so on the basis of just commercial principles, and not in opposition to them, as some have assumed would be the case.

With these explanations I shall simply read once more these provisions very carefully. I could continue talking on the different branches of the subject almost indefinitely, but I shall content myself with saying now that I shall be very glad to answer any questions that may suggest themselves to you, after I read these provisions again.

Mr. Rusby then read again items 1 to 4, inclusive, of the last resolution proposed by the committee, and continued:

Now, before I close I want to introduce my friend Dr. Jones, of California. He represents the medical side of the question. He came East last fall from California, where he showed great ability as an organizer, in order to help us along in this important matter. He came to New York for the purpose of studying out the best way of establishing a Bureau and to look after the legal aspect of the case, and he has been in New York ever since December engaged in this work.

I should like to add that every cent of expense incurred by the committee has been paid out of our own pockets. I paid my share, and it was pretty hard. Dr. Jones has not only paid his own expenses, but has lost his business during the intervening time. I want to assure you that no one is interested in any way in the payment of these expenses except the associations we represent.

Dr. Jones has had charge of the medical side, and government side, and legal side of this matter, and I am going to ask permission to introduce him to you, and ask him to say something on these subjects. Gentlemen, I have the pleasure to introduce Dr. Philip Mills Jones, of California. (Applause.)

Dr. Jones came forward and said:

*Mr. President and Members of the Association:* Dr. Rusby has told you that I have devoted myself entirely to the practical details and the medical and legal aspect of this subject. That is true. I took up this idea and became interested in it about a year ago, and for a long time was doubtful whether it was possible to do anything. But finally I thought I saw the possibility of getting the matter in such shape that it might lead to something, and I came to New York to take up the enterprise from its medical and legal side. I was pretty well satisfied what the views of the principal medical men were. My work in our California State Medical Society and my connection with our State University had brought me in touch with the prominent medical men of our coast, and in the American Medical Association I came in contact with leading men in the profession from other parts of the country. So it did not take me very long to find out what the position of the medical men was. From the Surgeon General of the Army and the Chief of the Bureau of Chemistry in the Department of Agriculture, I ascertained what was probably the attitude of those at the head of the government departments.

As to the legal side of the question, of course it was an absolutely new thing for a corporation to request a form of incorporation to carry on such general supervisory duties, without any desire to make money—that is, the question of an associate membership to do this work was an entirely new proposition. However, through personal friendship I was brought in touch with two or three very strong corporation firms in the East, devoting a great deal of their time to considering the legal questions involved in articles of incorporation generally, and they carefully considered this plan. A short time before leaving New York I had occasion to see one of these gentlemen—you would recognize the names of some of these lawyers if they were mentioned—and he told me that whether the plan was adopted by the associations or not, he considered the legal position which such a bureau would hold as being the strongest he had ever known. A bureau organized on that plan in the first place could not be sued by an outsider to certify any product that did not comply with its standard, and furthermore it not only could not be compelled by a lawsuit to do that work, but if it attempted it it would be illegal, and in violation of its charter provisions, and could be at once stopped from going on with the work. It would be clearly illegal to do anything of that kind. As to its legal liability under the plan as outlined, it would certify that the contents of each unbroken original package bearing its certificate had been manufactured with due care, and inspected with due care and precaution, and that it complied with the standards agreed upon between the Bureau and the United States Government authorities. Its

liability in case of error would be the value of the package on which the lable was placed.

The question as it applies to the United States Government authorities, is about this: Under the recent legislation—I think I am correct in this; if not, Mr. Kebler can set me right—the Department of Agriculture, acting with the Treasury Department, has certain rights and privileges. It can do certain things toward the exclusion of misbranded or adulterated or improper medicines and food-stuffs imported into this country. There are a good many things, as Mr. Kebler has heretofore said, that cannot be kept out under present conditions. Now, the Department has adopted fixed standards for food-stuffs, and it has authority to publish its findings in cases of adulterated or misbranded food-stuffs and medicines and so on. But it has no authority to carry out or enforce the standards it may fix. It has no authority to carry out any of the provisions against improper articles, except those that may be imported. It is strongly probable, however, that at the next Congress a bill will be passed very nearly like the bill that passed at the last session, known as the Pure Food and Drug Bill, with certain modifications, and that will place the control of the whole situation in the hands of the Department. It can do certain things now but it cannot do other things. The range of work will be so great then that the Department will have its hands full. I was instructed by my committee of the American Medical Association to confer with Dr. Wiley, as representing that work in the Government service, and determine whether or not the matter was agreeable and satisfactory to the Government, and what the relations of such a proposed bureau would be to the Government. I have Dr. Wiley's written opinion in the matter and it has been sent to the committee. The theory is this: That in the event such a bill should pass, the proposed bureau and the Department of Agriculture would work in perfect harmony, hand in hand, each supplementing the work of the other. The Department, for instance, could only condemn; the bureau, on the other hand, could certify that a large number of things did comply with the standards set. In case anything went wrong—if a member of the bureau fell from grace and departed from the strict path of virtue and honesty, and attempted to lower the standard of a product, or anything of that kind—the bureau would get into no trouble on account of that man; it would simply notify the Government authorities that that was the case, and they would take it up just as in the case of any other fraud in interstate commerce or anything else.

The question of the bureau's action on a large line of products naturally suggests itself. The biological products, for instance, can be certified by such a bureau as being up to the proper standard. As it is now, we have got certain things, but we don't know what we are using. We do not know whose statements are true—what is right and what is not right. Dr. Rusby and I have received stacks and stacks of letters, and I have an immense mass of stuff from every part of the United States giving specific instances where the article has been misrepresented and the physician misled, or where there was some deficiency, or defect, or adulteration in the thing itself.

I have conferred, I presume, with 250 of the principal medical men of this country—men for the most part connected with the larger medical schools and universities; men like the faculties of the various State medical departments—and without one single exception, to my knowledge, they are agreed that this or some similar move is most desirable; and if there is any chance whatever of the plan outlined here to be put through, they hope we will make the attempt.

On the business side, I want to say a word in furtherance of what Dr. Rusby has said. Dr. Rusby and you gentlemen will almost all of you look at this question from the standpoint of pharmacy, materia medica and chemistry. If you undertook to apply such a proposition to those things alone, it would be impossible for it to be done. The cost of doing the work would swamp it immediately. There are, however, enormous food industries in this country, and many of them are good. They are in competition with the

makers of the cheap adulterated products, and they are willing to devote a large proportion of their advertising funds towards the support of such a bureau, that would stamp their goods as being satisfactory and as complying with the standards of such a bureau and the government authorities. They look at it simply and solely as a business proposition; they want their goods differentiated from the adulterated goods on the market—it is worth money to them. There will be no misunderstanding in the matter. They realize that the amount of their contributions will be largely in excess of the cost of certifying their products alone, and that they would practically maintain the work of the bureau as applied to pharmaceuticals, chemicals and medicines; there is no misapprehension or misunderstanding on that point. But they are willing to contribute largely to the maintenance of the bureau for the benefit it will be to them. I have been to see a good many food-stuff manufacturers—fifteen or twenty companies—and I have found only one or two who have refused to accept the proposition. As a rule, they have been ready to give all that was asked, and some of them have expressed their willingness—and in some cases their keen desire—to have the work undertaken, and to place their products under the bureau's charge. The aggregate annual value of the food-stuffs manufactured by these concerns—and all of them would comply with the requirements of Dr. Wiley's department—amounts to between fifteen and twenty-five million dollars, and there are smaller concerns making food-stuff products that are equally good, and that I have not been able to reach or get at, that I have every reason to believe would be equally as anxious to see this work taken up, and who would be glad to become contributors to it, the aggregate of whose business would almost equal a like sum. In fact, the question of practicability from a financial standpoint is settled. The question is, whether we shall reach out and do this work, or whether we are afraid to do it. There have been but three firms who have out and out, without question or argument, stated that they would actually have nothing to do with such an enterprise. There are some ten or twelve others whom I have personally consulted who would be quite willing to be convinced that the work could be undertaken and practically carried out, so that it would do away with the trouble, without getting them into a still worse fix; and if they can be shown its practicability, I am perfectly convinced from the attitude they have assumed in the discussions we have had, that they would co-operate with such a bureau.

If there are any questions to be asked as to the legal points involved, or on the question of organization or otherwise, I should be very pleased to answer them as far as lies in my power. Gentlemen, I thank you. [Applause.]

THE PRESIDENT: In the name of the Association, I wish to thank Dr. Jones for his courtesy in thus giving us the result of the investigations of his committee, and his personal investigation, of this very important subject. Gentlemen, before any action is taken on this matter and discussion takes place I think a motion would be in order that any remarks on the subject should be confined to five minutes from any one member, as the time we have at our disposal is quite limited, and we have a great deal of business before us; also, that Mr. Rusby, in answering questions, shall confine himself to as brief remarks as possible until the close of the debate. In that way we can get the ideas and views of the members of the Association concisely, and not consume time unnecessarily. The report of the committee is before you, gentlemen. What shall we do with it?

Mr. Hallberg moved to limit the debate to five minutes for any one member, and Mr. Hancock seconded the motion.

MR. ANDERSON (of New York): I would oppose any motion of that kind at this time. The discussion of this important subject should be full and free on both sides, if it is to be so on one side. It would be unjust to those on the other side of this ques-

tion to allow those in favor of the passage of these resolutions to have all the time they desire and then confine those in opposition to it to five minutes. It seems to me that justice demands that those in opposition to the proposition should have an equal opportunity with those who have spoken in favor of it to place their side of the question before the Association.

Thereupon Mr. Hallberg withdrew his motion.

THE PRESIDENT: Gentlemen, the report is before you.

Mr. Alpers moved that the report of the committee be received and the recommendations taken up seriatim and voted on. The motion was seconded by Mr. Claus and carried.

THE PRESIDENT: The chairman of the committee had better read that report, or the resolutions.

Mr. Rusby read again the first clause of the preamble:

"WHEREAS, The foods and medicines supplied in the United States do not so uniformly agree with the proper standards of purity, quality and strength as they should."

THE PRESIDENT: You have heard the first clause of the preamble, gentlemen. What shall we do with it?

Mr. Eliel, seconded by Mr. Puckner, moved its adoption.

MR. LOEHR: In the statement of Mr. Rusby made in connection with the resolutions, he made reflections that I feel I cannot pass unchallenged. He said that a great many physicians could not find medicines pure enough for their purposes in the drug stores.

MR. RUSBY: That refers to the next paragraph.

MR. ANDERSON: It appears to me it is very unusual to adopt a preamble without first taking up the resolutions for consideration. I believe that the adoption of this preamble should be laid over until after *some* of the resolutions, at least, have been adopted. We do not want to condemn the products of this country and then turn around and refuse to adopt resolutions to rectify the trouble. Consequently, I move that action on this part of the report be postponed until action on the resolutions is had.

This motion was seconded by Mr. Hallberg.

Mr. Eliel thereupon withdrew his motion to adopt the first clause of the preamble above quoted.

Mr. Anderson's motion to postpone consideration of the preamble for the present was then put and carried.

MR. RUSBY: I presume the second clause of the preamble will share the same fate, then, but I will read it.

"*Whereas*, A degree of distrust and want of confidence concerning the quality of such foods and medicines prevails to a discouraging extent, therefore it is" resolved, etc.

Now, is it necessary to wait for a vote on the resolutions as to that? Must that be postponed until the resolutions are acted on? The two clauses I have read are the only

clauses of the preamble. Neither clause of the preamble contains a resolution. Then follows the first resolution:

"*Resolved*, That a more perfectly organized system for remedying the above-mentioned conditions than that now existing should be devised and put into operation."

Mr. Alpers moved the adoption of the recommendation.

Mr. Sayre, of Kansas, called for the reading of the clause again, and Mr. Rusby said that he presumed the motion of Mr. Alpers included the proviso.

Mr. Anderson said he desired to renew his motion to postpone action on this until the recommendations could be taken up in order, and the motion was seconded by Mr. Claus.

MR. ELIEL—If I understand the motion of Mr. Anderson, it is to postpone discussion, or consideration, of the preamble until after the provisions followlng have been acted on?

MR. ANDERSON: Yes, sir.

THE PRESIDENT: As I understand it, the clause just read is one of the recommendations.

MR. ELIEL: Voting aye on this question does not mean the endorsement, as I understand it, of the preamble. The desire is, to put that aside until we have acted on the various resolutions.

The Chair called on Mr. Anderson to state his motion again.

MR. ANDERSON: My motion is simply to postpone action on this one resolution until others are taken up. It appears to me that resolution should appear later—that it requires us to take some action; that it is practically an endorsement of it.

MR. HALLBERG: This is the first resolution, which is to the effect that it is the sense of this Association that it is desirable to institute *some* plan or method to correct the conditions named in the preamble—the two preceding clauses. What would be the use of spending any time here discussing a plan unless we first decided that it is desirable to institute some kind of method to correct the condition? It seems to me this is vital. We have to have the sense of this meeting as to whether or not we desire to go into this subject at all, and that is embodied in the first resolution.

MR. RUSBY: The committee were very careful, indeed, not to commit the Association in this. We simply say *some* plan should be adopted. It leaves the Association absolutely free as to what plan shall be adopted.

MR. BERINGER: In seconding the motion of Mr. Anderson I do so because, if I understand the reading of that resolution aright, it is connected with the preamble in such a way as that its adoption virtually adopts the preamble that we have laid aside. Therefore, I second the motion to temporarily postpone the first resolution.

MR. HOPP: I think the best thing we can do is to first decide whether we want this bureau or not. Then we can take up the preamble and the following resolutions, and adopt them.

MR. LOWE: There is a motion to postpone this resolution for the present, and I call for the question.

There were calls of "Question!" and the Chair put the vote on Mr. Anderson's motion to postpone, and it was lost.

MR. EBERT: Gentlemen, it is now half-past twelve. It will take us all the afternoon if we take up all these resolutions and discuss them, and you will have no lunch. I think I have followed the discussion as closely as possible. [Applause.] I have listened to what Mr. Rusby and Dr. Jones have said about their plan of inaugurating something to regulate commerce and everything else connected with the drug business and with medicine. Now it seems to me that we have come here to do good work. We are are all in sympathy with the highest standardization, no doubt, but I do not think we can afford to discuss for two or three hours a subject which, after we get through with it, we will not adopt. We can simply say that we approve of the plan that has been suggested for some kind of an improvement. The only way for us to do this practically—and I am in favor of what has been proposed—is to refer the matter to our Council. It was instituted for the very purpose of taking up just such work as this and reporting back to us. I do not think there is a man here, except Mr. Rusby and Dr. Jones—and possibly Mr. Hallberg, who is on that committee, I believe—who is qualified to vote on the subject. I am not, and I doubt whether any of you are. Now let us send this matter to the Council, which has been instituted for the very purpose of considering such things as this, and let it report back to this Association, even if it is a year hence. Do not let us jump from the frying-pan into the fire. In a year from now the Council may have this matter thoroughly digested and bring it before us for action. [Applause.]

THE PRESIDENT: The motion of Mr. Alpers was to adopt the first resolution as read, and it has a number of seconds, I believe.

MR. GOOD: I move, as a substitute for Mr. Alpers' motion, that the report of this committee be referred to the Council, with directions to report back to the Association as early as practicable.

Mr. Ebert seconded the motion.

MR. DIEHL: In voting upon this subject, I wish to qualify my vote. I wish to vote in favor of the adoption of this preamble, and then I wish to move that the entire subject shall be referred to the Council for action. I think that we ought, in one way or another, to let the Association decide whether the position taken by this joint committee is correct or not. [Applause.]

Thereupon Mr. Good withdrew his motion in favor of Mr. Diehl's, and Mr. Ebert seconded Mr. Diehl's motion.

The Chair called upon Mr. Diehl to state his motion again.

MR. DIEHL: My idea is, that we should adopt this preamble and the resolution immediately following, and let the remainder of the subject be referred to the Council for action.

There were several calls of "Question."

MR. TODD: I would like to ask the question whether the adoption of this motion now before the house would cut off any amendment to the resolutions proposed by the committee, if they shall be referred to the Council. I have in mind an amendment that I think the Association probably might listen to, and I should be glad to have an opportunity to offer that later on.

THE PRESIDENT: It would not be in order to offer it now. If this motion is passed, of course it would be in order to offer it when the Council makes its report.

The Chair then put the motion of Mr. Diehl, and it carried.

The Chair called for reports of the standing committees, and named the report of the Secretary as first in order.

That officer read his report as follows:

## REPORT OF THE FINANCIAL ACCOUNTS IN THE CARE OF THE GENERAL SECRETARY.

### A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF NATIONAL FORMULARY, FROM JULY 1, 1902, TO JUNE 30, 1903.

*I. Receipts.*

| | | |
|---|---|---|
| From Sales and Payment of Bills due July 1, 1902 | | $362 34 |

*II. Expenditures.*

| | | |
|---|---|---|
| Paper and Press-Work, 500 copies National Formulary | $40 00 | |
| Binding 506 copies National Formulary in cloth, @ 11 cts. | 55 66 | |
| " 33 " " " " int., @ 18 cts. | 5 94 | |
| " 850 " Physicians' Epitome, N. F., @ 4¼ cts. | 36 13 | |
| Imprinting cover of Physicians' Epitome | 4 25 | |
| Expressage and Postage (National Formulary) | 11 20 | |
| " " " (Physicians' Epitome) | 1 47 | |
| | | $154 65 |

*III. Remittances.*

| | |
|---|---|
| To Treasurer, as per Treasurer's Receipts | $362 34 |

*IV. Sales.*

| | | |
|---|---|---|
| To dealers and individuals, as per ledger accounts: | | |
| National Formulary | $215 55 | |
| Physicians' Epitome | 118 38 | |
| | | $334 93 |

*V. Accounts Unpaid.*

| | |
|---|---|
| By dealers | $48 53 |

*VI. Bills Due by the Association.*

All bills due have been paid.

*VII. Stock on Hand.*

| | |
|---|---|
| Copies in flat sheets (unbound) | 000 |
| Copies bound in cloth | 325 |
| " " " interleaved | 12 |
| " " sheep | 00 |
| " " " interleaved | 1 |
| | 338 |

### B. SUMMARY OF TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF NATIONAL FORMULARY SINCE 1888.

| | | |
|---|---|---|
| Receipts to June 30, 1902 (see Proc., Vol. 50, p. 53) | $12,532 46 | |
| Receipts from July 1, 1902, to June 30, 1903 | 362 34 | |
| | | $12,894 80 |

| | | |
|---|---|---|
| Expenses to June 30, 1902 (see Proc., Vol. 50, p. 53) | $7,475 38 | |
| Expenses from July 1, 1902, to June 30, 1903 | 154 65 | |
| | | $7,630 03 |
| Total Receipts from Sale of Physicians' Epitome from June 1, 1900, to June 30, 1903 | | $486 77 |
| Total Expenses on Account of Physicians' Epitome from June 1, 1900, to June 30, 1903 | | 602 65 |

C. SALE OF PROCEEDINGS.

| | |
|---|---|
| Receipts from July 1, 1902, to June 30, 1903 | $93 05 |
| Remitted to Treasurer, as per Treasurer's Receipts | 93 05 |

D. ACCOUNT OF BADGES AND BARS.

| | | | |
|---|---|---|---|
| On hand July 1, 1902 (see Proc., Vol. 50, p. 54) | Badges 26, | Bars 97 | |
| Received Sept. 20, 1902, from Henry Briele, Mfr. | " 20 | " 40 | |
| | 46 | 137 | |
| Badges sold from July 1, 1902, to June 30, 1903, 18 @ $2.00 | $36 00 | | |
| Bars sold from July 1, 1902, to June 30, 1903, 38 @ 75 cts. | $28 50 | | |
| 1 @ 50 cts. | 50 | 29 00 | |
| | | | $65 00 |
| Remitted to Treasurer, as per Treasurer's Receipts | | | 65 00 |
| Balance on hand July 1, 1903 | Badges 28. | Bars 98 | |
| Receipts from Sale of Badges and Bars to June 30, 1902 (see Proc., Vol. 50, p. 54 | $918 35 | | |
| Receipts from July 1, 1902, to June 30, 1903 | 65 00 | | |
| | | | $983 35 |
| Total Cost of Badges and Bars to June 30, 1902 (see Proc., Vol. 50, p. 54) | $907 60 | | |
| Cost of 20 Badges received September, 1902 | 37 00 | | |
| Cost of 40 Bars received September, 1902 | 28 00 | | |
| | | | $972 60 |

CHAS. CASPARI, JR., *General Secretary.*

*Baltimore, July 2, 1903.*

THE PRESIDENT: Gentlemen, you have heard the report of the General Secretary. What will you do with it?

On motion of Mr. Dohme, the report was ordered received.

The Chair stated that the next business in order was the reading of the minutes of the Council, and Mr. Whelpley, Secretary of the Council, read the minutes of the fourth session, held at 9 a. m., August 4th:

FOURTH SESSION OF THE COUNCIL—AUGUST 4, 1903.

The Council convened at the Grand Hotel at 9:30 a. m., with Chairman Beal presiding. The following members were present at roll-call: Alpers, Beal, Beringer, Caspari, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Payne, Schlotterbeck, Sheppard, Whelpley, Wooten, the absentees being Baker, Cliffe, Perry, Rapelye, Willis. The minutes of the third session of the Council were read and approved.

On motion by J. O. Schlotterbeck, seconded by C. Lewis Diehl, fifteen applications for membership were referred to the General Association, with the recommendation that they be invited to complete their membership.

On motion of S. A. D. Sheppard, seconded by E. G. Eberle, the Committee on Cen-

tennial Fund was instructed to consider the suggestion of enlarging the use of the fund, and to report at a subsequent session of the Council.

On motion by E. G. Eberle, seconded by J. W. T. Knox, the amendment of Chapter 4 of the By-Laws of the Council submitted at the previous session was adopted.

On motion of G. M. Beringer, seconded by J. F. Patton, the suggestion of H. M. Whelpley, Secretary of the Committee on Membership, that the pictures of deceased members be printed as an insert with the report of the Committee on Membership, was approved and referred to the Committee on Publication.

Chairman Beal, of the Council, presented the following report on the invested funds of the Association, and it was received and referred to the Committee on Publication:

## REPORT OF THE CHAIRMAN OF THE COUNCIL ON THE FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The past year has witnessed an important change in the plan of investment of the Permanent Funds of the Association, by which the value of the funds has been materially enhanced without detracting in the least from the security of the investment.

Hitherto it has been the policy to invest the accumulations in United States bonds, which because of the demand for them as the basis of circulation of national banks command a very high rate of premium. As a consequence the Association always had a material part of its resources invested in premiums, the value of which decreased with each year in the life of the bonds. Our efficient Treasurer reported that it was possible to secure bonds of the State of Massachusetts at par and accrued interest, and recommended that the United States bonds be sold and reinvested in the bonds of that State. After inquiry from banks accustomed to dealing in such bonds it was learned that Massachusetts bonds were regarded as equally safe with those of the United States government, and accordingly after careful consideration in Council, it was ordered that our U. S. bonds be sold and reinvested in accordance with Mr. Sheppard's suggestion.

The several transactions were effected as directed, and the premium realized amounted approximately to $1400.00. This has been reinvested in the Massachusetts bonds, and deposited in the Boston Penny Savings Bank, and is now a part of our permanent invested resources and is yearly accumulating interest instead of decreasing yearly in value as under the former plan of investment. After allowing for the difference in interest, the actual gain to the association by the transfer is something more than $1000.00.

The investments and securities now in the hands of the Chairman of the Council are as follows:

EBERT FUND.

| | | |
|---|---|---|
| Deposit in Boston Penny Savings Bank, Book No. 56461 | | $879 22 |

CENTENNIAL FUND.

| | | |
|---|---|---|
| 1 Massachusetts State 3 % bond | $1,000 00 | |
| Deposit in Boston Penny Savings Bank, Book No. 56462 | 888 65 | |
| | | $1,888 65 |

PROCTER FUND.

| | | |
|---|---|---|
| 13 Massachusetts State 3 % bonds | $13,000 00 | |
| Deposit in Boston Penny Savings Bank, Book No. 56463 | 1,014 02 | |
| | | $14,014 02 |
| | | $16,781 89 |

Bond of American Bonding Company, of Baltimore, for $5,000, from S. A. D. Sheppard to American Pharmaceutical Association, from March 15, 1903, to March 15, 1904.

J. H. BEAL, *Chairman of the Council.*

## REPORT OF THE CHAIRMAN OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION ON THE FUNDS OF THE ASSOCIATION.

The investments and the cash in bank belonging to the several funds of the Association, in the custody of the Chairman of the Council on June 30, 1903, are as follows:

EBERT FUND.

| | |
|---|---|
| Deposit in Boston Penny Savings Bank, Book No. 56461 | $879 22 |

CENTENNIAL FUND.

| | |
|---|---|
| 1 Massachusetts State 3 % bond, No. 1705 | 1,000 00 |
| Deposit in Boston Penny Savings Bank, Book No. 56462 | 888 65 |

PROCTER FUND.

| | |
|---|---|
| 13 Massachusetts State 3 % bonds { 10 m No. 1701; 1 m No. 1703 / 1 m No. 1702; 1 m No. 1704 } | $13,000 00 |
| Deposit in Boston Penny Savings Bank, Book No. 56463 | 1,014 02 |
| | $16,781 89 |

Bond of American Bonding Company, of Baltimore, for $5,000.00, from S. A. D. Sheppard to American Pharmaceutical Association, from March 15, 1903 to March 15, 1904.

STATE OF OHIO } ss.
COUNTY OF FRANKLIN }

The undersigned, J. H. Beal and Geo. B. Kauffman, being first duly sworn, depose and say that the above is a true statement of the bonds in the hands of the said J. H. Beal, and of the amounts deposited in the Boston Penny Savings Bank, as shown by the pass books of said bank, bearing numbers 56461, 56462, and 56463.

J. H. BEAL,
GEO. B. KAUFFMAN.

Sworn to before me and subscribed in my presence this 11th day of July, 1903.

WM. ALTMAN, *Notary Public.*

On motion of S. A. D. Sheppard, seconded by T. V. Wooten, the Council adjourned, to meet again at 9:30 a. m., August 5.

Mr. Eberle, of Texas, moved to adopt as read, and the motion had a second in Mr. Claus, of St. Louis, and was carried.

The report of the Committee on Transportation was then read by the chairman, as follows:

## REPORT OF THE COMMITTEE ON TRANSPORTATION.

*Mr. President and Members of the American Pharmaceutical Association:*

Your Committee on Transportation beg leave to report that application was made early in May of the present year to the Michigan Passenger Association for reduced rates on account of the fifty-first annual meeting, and a rate of one and a third fare for the round trip, on the certificate plan, was promptly granted. This arrangement was subsequently concurred in by the Trunk Line Association, the New England, the Southeastern, the Central and the Western Passenger Associations, as also the Northern Steamship Company of Buffalo and the Manitou Steamship Company of Chicago. The charge of twenty-five cents to individual holders of certificates for validation of the same, which was inaugurated last year, has been continued in force by the railroad companies. It has been agreed that the special agent of the Michigan Passenger Association shall be in attendance at the meeting on Thursday, August 6th, from 9 a. m. to 6 p. m., for the purpose of validating all certificates presented.

Mackinac Island being a well-known and much-frequented summer resort, excursion rates are obtainable from many points at figures even lower than the reduced rate offered by the railroads, and hence some of our members will naturally avail themselves of the same, but it is nevertheless hoped that a sufficient number will travel on the certificate plan to insure the necessary 100 certificates required by the railroad companies.

For the Committee. CHAS. CASPARI, JR., *Chairman.*

Baltimore, August 1, 1903.

On motion the report was referred to the Publication Committee.

Mr. Whelpley then moved that the fifteen applicants for membership whose names had been submitted at the opening of this session be now invited to complete their membership, and the motion was seconded by Mr. Hopp, and carried.

The Chair called for the report of the Committee on Revision of the

U. S. Pharmacopœia, R. G. Eccles, chairman. Mr. C. M. Riley, of the committee, said a report had been received from the chairman, who was not able to be present, and with the advice and consent of the only other member of the committee besides himself present he would read the report sent as the report of the committee. Mr. Whelpley suggested that it was customary to read the report by title only in the general session and refer the paper to the Scientific Section for discussion and action, and made a motion accordingly. Mr. Dohme seconded the motion and it carried.

The Secretary read the following proposed amendments to the By-Laws, which, he explained, would have to lie over until the next session, under the rule, and which, he said, involved merely the transposition of two articles, so that the work of the section on education and legislation might precede that on practical pharmacy and dispensing, instead of following it, as at present. Mr. J. W. T. Knox, chairman of the section first named, was the mover of the proposed amendments.

PROPOSED AMENDMENTS TO BY-LAWS OF A. PH. A.

Article VI of Chapter VIII shall be amended to read as follows:

"At the fourth and fifth sessions the Section on Pharmaceutical Education and Legislation shall consider the business assigned to that Section."

Article VIII of Chapter VIII shall be amended to read as follows:

"The eighth and ninth sessions shall be devoted to the subject of Practical Pharmacy and Dispensing."

The Chair called for the report of the Committee on General Prizes, and H. H. Rusby, Chairman, asked the Secretary to read it, which he did as follows:

REPORT OF THE COMMITTEE ON GENERAL PRIZES.

This Committee has found almost an embarrassment of riches in the large number of meritorious papers presented to it for examination, and has met with some little difficulty in reaching a decision regarding some of them. The following are our conclusions:

1. The John M. Maisch Prize is to be awarded to some paper connected with Pharmacognosy, and that by P. E. F. M. Perrédès, on the *Anatomy of the Stem of Derris uliginosa* appears justly entitled to this award.

2. The Hager Prize is to be awarded, preferably, to a paper on some pharmaceutical subject. It appears to us that the application of physiological methods in pharmaceutical assaying in the simple manner proposed by L. W. Famulener and A. B. Lyons in testing the value of preparations of Digitalis is an event of the first importance and in the highest degree entitled to recognition, which we recommend be done by awarding the Hager Prize to them.

3. With the above exceptions, no other subject discussed at the meeting appears of greater importance than that of the estimation of strychnine present in mixtures of strychnine and brucine so ably discussed by H. M. Gordin. The author submitted the results of a comprehensive study and a careful comparison of all methods hitherto proposed, and suggested such an improvement upon the rest of them as appears to perfectly solve this important problem. We therefore recommend that the first general prize go to Mr. Gordin.

4. Concerning the second and third general prizes, we found quite a number of almost equally meritorious papers in their respective lines to decide between. We feel compelled, however, to award the second general prize to Dr. Ed. Schaer, for his paper on *Guaiac-blue and Aloin-red, and Their Use;* and the third general prize to Mr. J. O. Schlotterbeck for his paper on *The Color-Compound of Stylophorum-diphyllum and Chelidonium Majus.*

OSCAR OLDBERG,
WILBUR L. SCOVILLE,
H. H. RUSBY, *Chairman,*
*Committee.*

Mr. Remington, seconded by Mr. Eberle, moved the adoption of the report just read. Carried.

At request of the Chair, the Secretary read the following report from the Committee on National Legislation:

*July 29, 1903.*

*To the Officers and Members of the American Pharmaceutical Association:*

*Gentlemen:* Your Special Committee on National Legislation having completed another year's service, respectfully reports that no legislation of a national character has been enacted during the past year that has affected pharmacy or the pharmacist that required the attention of your special committee.

Respectfully submitted, FRANK C. HENRY,
*Chairman Special Committee on National Legislation.*

On motion of Mr. Good, the report was received.

The Chair called up the Report of the Committee on National Formulary.

The Secretary said that it was customary to receive the report and refer to the Committee on Practical Pharmacy and Dispensing, and on motion of Mr. Hallberg it was so referred.

Mr. Mittelbach, chairman, made the following report for the Auxiliary Committee on Membership:

## REPORT OF CHAIRMAN OF AUXILIARY COMMITTEE ON MEMBERSHIP.

BOONVILLE, MO., *Aug. 1, 1903.*

It was with some hesitation, due to a feeling of misgiving, that I accepted the chairmanship of this very important committee, knowing the immense amount of correspondence connected with this work and the generally unsatisfactory results. As a rule this committee is appointed a little late, my committee not being able to organize until about May 1st, this year. To accomplish the best results, the committee should be appointed at the meeting or immediately thereafter. It will then have a whole year to push its work. I would recommend that this be done in the future.

Immediately upon being notified of my appointment and upon receiving a list of my associates on the committee, I formulated and sent out general instructions, organizing the committee and indicating the part each member should take. I inclosed blank applications and printed matter, giving information about our Association, and requested them to assist in this very important work. The amount of labor asked was very little I thought, being only five applications from each State and Territory. I also wrote to about forty pharmacists of the army and navy trying to secure their applications. Some of them responded, praising the work of this Association, and several sent in their applications to H. M. Whelpley, Secretary of the Council.

From a total of 72 members of the committee I received acknowledgements from 14 accepting the work assigned them, and promising a hearty co-operation. About July 1st, I again wrote the several members of the committee, calling their attention to the fact that the meeting of the Association is near at hand, and if the Committee intended to make a good report it must "get a move on" itself. But two or three heard from to this request. About this time I also addressed personal letters to about 40 pharmacists of my own state soliciting their applications. From this effort I received but one application directly. Am under the impression, however, that the Secretary of the Council, H. M. Whelpley, received others. The only other State from which I received applications is Michigan, and then through a non-member. Mr. Wm. C. Kirchgessner, of Grand Rapids, not only sent his application in, but also secured three others from his city. I mention this because it shows what can be done by personal solicitation.

Solicitation through the mail will not secure many new members. The appeal is laid aside and soon forgotten, or at once consigned to the waste basket. I have come to the conclusion that better results would be obtained if the prospective applicants were approached personally by the right kind of a solicitor. Let the Association find one of its members in each State and Territory that *will* devote some time and attention to this work; some one that will make a proper canvass of his territory. Give him power to appoint assistants—commercial travelers, if possible—and thus call on the desired candidate. Show the candidate a copy of our Proceedings. The Association should also allow a sum not exceeding $1.00 as expense in securing each new member. This may be an incentive to some members to help in this work, and will in the aggregate be no more than is spent under present arrangements.

My expense account during the year was $15.05 for printing and postage. It costs the Association this much to get $25.00 apparently. If this report was not backed by that of the General Committee on Membership, with 150 or more applications for membership, I would certainly feel very much ashamed of the results of my work. The Association would quickly sit down on such a committee, and order retrenchment for future ones.

I believe the several recommendations and suggestions are worthy of consideration, and I hope the Association will give the proposed methods a trial.

Fraternally yours, WM. MITTELBACH,
*Chairman of Auxiliary Committee on Membership.*

Mr. Sheppard, Treasurer, moved that the report be received and its recommendations adopted, and Mr. Whelpley seconded the motion.

Mr. Sheppard then said:

*Mr. President:* Mr. Mittelbach has struck the keynote of our difficulty, I think. I believe it is the right course to pursue, and I would like to speak on that line as Treasurer. It is an idea I have advocated for many years. I believe that the getting of new members for this Association is a parallel case to getting life insurance. The life insurance agent gets a commission for his work, and he ought to. He is making A, B and C acquainted with something that they need. Now, I believe that a great many druggists of this country—thousands of them—need the American Pharmaceutical Association and do not know it. I believe that our members ought to be paid for their labor in making others acquainted with their individual need. I think the suggestion that Mr. Mittelbach makes as chairman of that committee is exactly in the right direction—that we should be authorized to pay not exceeding one dollar as commission or compensation to any one who brings in a new member. We can well afford to do it; it will pay the Association in the long run.

THE PRESIDENT: Before the matter is put to a vote I would like to say a word or two myself on that subject. Mr. Sheppard spoke about a commission of a dollar to those who secure new members. In my experience in securing members for various associations, I think the man who gets them will pay out a good deal more than a dollar apiece for them, in actual stamps, and sending out letters, etc.

Mr. Sheppard's motion was then put and carried.

Mr. Joseph P. Remington, of Philadelphia, chairman of the Committee on William Procter Fund, then made the following report:

## REPORT ON THE PROCTER MEMORIAL FUND.

At the last session of the annual meeting in 1902, a motion by Mr. Sheppard was adopted, as follows:

"That a committee of three be appointed by the Chair to consider the advisability of allowing the William Procter Fund to remain intact until the principal amounts to at least $25,000."

For the information of the members, it may be stated that the William Procter Fund, formerly known as the Life Membership Fund, now amounts to $16,781.89. This represents the accumulation of life-membership dues of those of our members who have taken advantage of our By-Laws, which provide, in Chapter VII, Article iv, that "any member, not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, or after twenty-five years $30, or after thirty years $20, or after thirty-five years $10, also any member who shall have paid to the Treasurer annual dues for thirty-seven years, shall become a life member, and shall be exempt from all future annual contributions."

The question which your committee has been asked to report upon especially is the one of permitting the fund to remain intact until it amounts to $25,000. They are of the opinion that this motion should pass. It would be possible, without very much effort, to induce many more of our members to avail themselves of the very liberal provisions of the by-law above quoted. Some of the younger and middle-aged members who could spare 70, 60 or 50 dollars, would doubtless find it profitable to themselves personally to avail themselves of this opportunity, and the fund could in this way soon be raised to $25,000.

It must be remembered that our Association is subject to changes and vicissitudes, and few things add more to the strength of an association than funds so invested that they cannot be squandered. Such give stability and character to any organization. When this fund reaches the sum of $25,000 it can then be determined what disposition should be made of it, but it should be used in a wise and safe way, to still further increase the strength of this body. What better tribute to the memory of Prof. Procter can be devised than one like this, which will strengthen the Association and permanently further its interests? If the interest accruing from the fund of $25,000 can be used yearly for the betterment of the condition of pharmacists in this country, it will, in the opinion of your committee, perpetuate the name of William Procter, by bringing it prominently before the Association, of which he is one of its honored founders. Your committee recommends that an energetic canvass be made among the members to induce them to become life members, so that this fund be raised immediately to $25,000.

Respectfully submitted,

JOSEPH P. REMINGTON,
JAMES H. BEAL,
JAMES M. GOOD,
*Committee.*

The report was applauded, and Mr. Ryan moved to receive and approve, which motion had a second in Mr. Hallberg, and the motion prevailed.

In the absence of the Chairman (Mr. Hechler) of the Delegates to National Retail Druggists' Association, Mr. Wm. McIntyre, of the committee, read a report drawn up by Mr. Meissner and himself, they being the only two members of the delegation present:

### REPORT OF THE DELEGATES TO THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

The meeting was held at Cleveland, Ohio, with an enthusiasm difficult to keep within bounds. The important business of the convention was transacted. Our chairman was not present, and the report submitted is made by the members of the delegation that were there.

The President of our Association has at this meeting outlined the relation of deep interest and hopefulness for success in this work for the pharmacist which the National Association of Retail Druggists has undertaken.

The National Association of Retail Druggists is determined to not only win back all that has been lost to the pharmacist by the untoward conditions of business in the past, but to make for him a profitable and honorable position. We are pleased to report that their plan of education, now supported by better financial assistance, has accomplished splendid results. This condition was attested to by very many of the delegates.

Their association motto—"Live and let live"—when well understood and applied by all allied branches having relations to our trade—and ourselves—we have every reason to feel will insure success.

Respectfully submitted,

WILLIAM MCINTYRE,
F. W. MEISSNER.

The report was received with applause and, on motion of Mr. Ryan, was adopted.

The President called on Second Vice-President Eberle to take the chair while the Committee on President's Address made its report. Mr. Ryan then presented the following:

### REPORT OF THE COMMITTEE ON PRESIDENT'S ADDRESS.

*To the American Pharmaceutical Association:*

*Gentlemen:* Your Committee on the President's Address beg leave to submit the following report on the recommendations contained therein:

1. That the General Secretary provide the incoming President with a list of the committees to be appointed by him, is approved.

2. Providing for the printing in the annual Proceedings of the list of the committees appointed by the President, in a group by themselves, for more convenient reference, to be referred to the Publication Committee, with favorable recommendation.

3. Report made at last session.

4. Your committee does not approve the publication of the names of members who present applications of new members.

5. Providing for the preparation of a separate index of the report on the Progress of Pharmacy. We recommend that it be referred to the Committee on Publication for consideration.

6. Providing for a committee of five to investigate disparaging statements in reference to members of this Association, is not approved.

7. We approve the recommendation to continue exhibits whenever practicable.

8. Providing for a committee of ten to draft a model poison law, is not approved, such a law having been previously approved by this Association as a part of the model pharmacy law, the same being now in force in the State of Ohio.

9. Referring to the use of alcohol in pharmaceutical products and providing for a regulation of tax on the sale thereof; referred to the Committee on National Legislation for consideration.

10. We approve the recommendation to continue the effort for reduction of the tax on alcohol.

11. To change the name of the Auxiliary Committee on Membership to General Committee on Membership, is approved.

12. Providing for a committee of five to consider the feasibility of publishing the formula for domestic remedies; referred to the Committee on National Formulary.

Respectfully submitted,

F. G. RYAN, *Chairman.*
JOHN F. PATTON,
J. W. BAIRD.

The various items of the report were taken up *seriatim* and acted upon.

Mr. Ryan, chairman, read the first recommendation, as to list of committees for new president. On motion of Mr. Mayo the recommendation was adopted.

The chairman read the second recommendation, as to printing list of committees appointed by the President in the Proceedings. Mr. Good, seconded by Mr. Roehrig, moved to adopt. Carried.

Mr. Ryan read the committee's reference to the third item or recommendation in the President's Address, referring to joint conference of instructors in Colleges of Pharmacy and members of State Boards of Pharmacy present at this meeting, the favorable report of the committee having been approved at yesterday's general session.

The chairman read the fourth item, in which the committee does not approve the publication of the names of members who present applications of new members. Mr. Ebert moved to concur, which motion was seconded by Mr. Good and carried.

Mr. Ryan read the fifth item, recommending reference of the question of separate index of Report on the Progress of Pharmacy to Publication Committee. On motion of Mr. Wooten, the clause was adopted.

The sixth item was read by the chairman, expressing the committee's disapproval of a committee of five to investigate disparaging statements about members of the Association. On motion of Mr. Ebert, seconded by Mr. Wilbert, the committee's view was sustained.

Item 7 was read, approving of the continuation of exhibits wherever practicable. Mr. Anderson, seconded by Mr. Claus, moved to adopt.

MR. SHERMAN: Who will pass on the question of when it is practicable?

SEVERAL VOICES: The Council.

MR. SHERMAN: Then speaking on that line, I think our Council is sufficient to decide on that and all such subjects. Personally I am not in favor of exhibits, believing that the good that comes does not justify the outlay of time and expense. I do not think the

manufacturers themselves are in favor of them, and only make them because they are asked to and do not care to refuse.

MR. RUSBY: I would like to say that I do not think the exhibits have always been of the right character. I think the historical exhibit made at Philadelphia was in the highest degree important, and of great credit to the Association, and I do not see why exhibits of that kind ought to be confined to jubilee occasions. I think we should have them at all meetings of the Association, and all those who represent the Scientific and Educational Sections ought to assist in getting such exhibits together.

MR. SHERMAN: I did not have in mind the character of exhibits Mr. Rusby refers to.

MR. SHEPPARD: I would like to emphasize what Mr. Rusby has said, and to add that that exhibition in Philadelphia brought something over $900 into the treasury.

MR. GOOD: Mr. President, it is conceded that the exhibition we had at Philadelphia was exceedingly valuable. The gentleman who objects to exhibits does not contest that at all. Going back a year further, to the time when the plan of having exhibits was revived, we had an exhibit at St. Louis, the general character of which was such as to commend it to the Association. That was a very creditable exhibit, and was of profit to the members of the Association. I should be very sorry to see them discontinued now, with such encouraging examples as we had in the last two exhibits.

The chair then put the vote on the motion to adopt the recommendation of the committee, and it carried.

By item 8, the committee disapproved of a committee of ten to draft a model poison law, for the reasons named, and, on motion of Mr. Burke, the committee's position was approved.

On motion of Mr. Claus, the recommendation of item 9, as to the use of alcohol and tax on the sale thereof, was adopted.

The recommendation of item 10, as to a reduction of the tax on alcohol, was adopted, upon the motion of Mr. Whelpley.

Mr. Sheppard moved to adopt the recommendation of item 11, as to change of title of Auxiliary Committee on Membership to General Committee on Membership, and the motion prevailed.

The Association also concurred in the suggestion of the committee in item 12, to refer to Committee on National Formulary the question of publishing formulæ for domestic remedies.

Upon motion of Mr. Whelpley, seconded by Mr. Claus, the report of the committee as a whole was then adopted.

President Payne resumed the chair and called for the report of delegates to National Wholesale Druggists' Association, Mr. Caswell A. Mayo, of New York, chairman.

Mr. Mayo said he had no written report, but made the following verbal report:

Our delegates to the meeting were very cordially welcomed and shown every possible courtesy, and it was interesting to note that many lines of work in which the two Associations are engaged are practically identical. It was somewhat of a surprise for your delegates to discover the unanimity with which the Committee on Drug Adulterations of

the National Wholesale Druggists' Association reported that the quality of drugs was very fine, whereas our own committee has reported quite the contrary. The National Wholesale Druggists' Association has taken very great interest in the matter of reduction of the tax on alcohol. They seemed not to be particularly interested in the effort to introduce methylated alcohol, but were interested in the Joy Bill. There was no action taken by the Association that affected our own organization particularly, beyond the fact that they received us very cordially and invited us to send delegates again.

THE PRESIDENT: Gentlemen, You have heard the verbal report of the chairman of your committee. What is your pleasure?

Mr. Dohme, seconded by Mr. Anderson, moved to receive and adopt. Carried.

The Chair called for the report of the Committee on Correspondence with the Carnegie Institute, at Washington D. C., and Mr. Mayo, chairman, read the following:

## REPORT OF THE COMMITTEE ON THE CARNEGIE INSTITUTION.

In pursuance of resolutions adopted at the Philadelphia meeting, the President appointed a committee of twenty-five members, who, through the chairman, submitted the accompanying address to the Trustees of the Carnegie Institution, having first ascertained that the Board would prefer to have the address presented in writing rather than in a personal interview.

The chairman first submitted the proposed address to the members of the committee by mail, and after incorporating in it the various suggestions offered by the members of the committee, the address was laid before the Board of Trustees, and in response the Secretary of the Executive Committee of the Board of Trustees wrote as follows:

"The Executive Committee has considered the address of the committee of the American Pharmaceutical Association, and has decided that it is not expedient at the present time to establish an advisory Committee on Pharmaceutical Research."

Your committee respectfully submits the correspondence in the case, and recommends that at some future time the application be renewed.

Respectfully submitted. For the committee. CASWELL A. MAYO, *Chairman.*

CARNEGIE INSTITUTION, 1439 K STREET, WASHINGTON, D. C., *November 18, 1902.*

MR. CASWELL A. MAYO, *New York, N. Y.:*

*Dear Sir:* In response to yours of the 17th, I beg to say that it is unlikely that the Trustees will have time to listen to any oral presentation of projects. It is undoubtedly best to submit a clear and concise statement of your proposition in writing for reference to the Executive Committee, who will study it and act upon it if they have power, or, if they have not, refer it to the Board of Trustees with a recommendation.

Very truly yours, MARCUS BAKER, *Asst. Sec.*

*To the Trustees of the Carnegie Institution:*

*Gentlemen:* At the semi-centennial meeting of the American Pharmaceutical Association in Philadelphia last September the following preamble and resolutions were adopted:

WHEREAS, Pharmacy in its various branches is confronted with many important problems which can only be solved by original research involving labors so great as to be wholly beyond the hope of achievement by the individual pharmacist under ordinary conditions, and,

*Whereas,* The solution of these scientific problems is fraught with immense possibilities of good to the human race in the discovery of new drugs and the simplification and more complete comprehension of the Materia Medica, and,

*Whereas,* According to the articles of incorporation, the objects of the Carnegie Institution are: "(a) To conduct, endow and assist investigation in any department of science, literature or art, and to this end to co-operate with governments, universities, colleges, technical schools, learned societies and individuals; (b) To appoint committees of experts to direct special lines of research; (c) To publish and distribute documents;" therefore, be it

*Resolved*, That the American Pharmaceutical Association hereby petitions the Board of Trustees of the Carnegie Institution to establish an Advisory Committee on Pharmaceutical Research and provide funds promoting original research in pharmaceutical science, and be it

*Resolved*, That the President of the American Pharmaceutical Association be instructed to appoint a committee of twenty-five members, which committee shall be charged with the duty of laying the above resolutions before the Carnegie Institution, together with suggestions as to how the work of this Advisory Committee may be conducted and made most effective.

Pursuant to these resolutions a committee has been appointed representing not only the American Pharmaceutical Association but various teaching institutions connected with pharmacy, to lay the matter before you and to proffer their services in furnishing any information that may be desired regarding research in this particular field.

The phraseology of the original deed of trust warrants the inference that some portion of the funds of the institution are to be devoted to applied science, and if this is to be done this committee would respectfully urge that the Board of Trustees name an Advisory Committee on Pharmaceutical Research and appropriate such funds as may be required to carry out certain lines of co-operative research with the advice and under the direction of such Advisory Committee, and also appropriate funds for individual research in this field.

It is respectfully suggested to the Board of Trustees of the Carnegie Institution that it is not only important to determine as to what work needs to be done in the domain of science, but also to determine what work is not being done and is not likely to be done through other agencies already interested. There are many important problems awaiting solution in the field of pharmaceutical research; but the solution of these problems offers no prospect of any financial return, and unless their study is undertaken by some such body as the Carnegie Institution, they will remain unsolved.

As one specific field for such research work, your committee would direct attention to the paucity and inaccuracy of our present knowledge of the drugs indigenous to the United States. Such research work as has already been done in this particular field has been accomplished through individual effort, either alone or under the assistance and direction of the Research Committee of the American Pharmaceutical Association. The results, however, have in most instances lacked completeness because of the absence of co-operation and authoritative direction and the impossibility of securing research workers who are in a financial condition to devote themselves exclusively to one line of work for a long-continued period.

In view of the facts cited above, the American Pharmaceutical Association respectfully urges that the Board of Trustees of the Carnegie Institution appoint a Committee in Pharmaceutical Research, and appropriate yearly such sums as may seem advisable to carry on research in this field. Should these suggestions commend themselves to the Board of Trustees of the Carnegie Institution, the American Pharmaceutical Association would be pleased to co-operate in every possible way in carrying out these suggestions. And should the Board of Trustees desire to discuss the subject, the Committee of the American Pharmaceutical Association would be pleased to have several of its members appear before your Executive Committee at such time and place as may suit your own convenience.

Respectfully submitted,

C. L. DIEHL, Louisville College of Pharmacy, Louisville, Ky.,
A. B. STEVENS, School of Pharmacy, University of Michigan, Ann Arbor, Mich.,
H. H. RUSBY, New York College of Pharmacy, New York City.,
L. E. SAYRE, School of Pharmacy, University of Kansas, Lawrence, Kansas,
HENRY KRAEMER, Philadelphia College of Pharmacy, Philadelphia, Pa.,
EDWARD KREMERS, School of Pharmacy, University of Wisconsin, Madison, Wis.,
H. W. WILEY, Chief Chemist, Department of Agriculture, Washington, D. C.,
FRANK C. HENRY, Washington, D. C.,
H. P. HYNSON, Maryland College of Pharmacy, Baltimore, Md.,
WM. M. SEARBY, School of Pharmacy, University of California, San Francisco, Cal.,
JAS. H. BEAL, School of Pharmacy, Scio, Ohio,
E. L. PATCH, Massachusetts College of Pharmacy, Stoneham, Mass.,
W. L. SCOVILLE, Massachusetts College of Pharmacy, Boston, Mass.,
C. S. N. HALLBERG, School of Pharmacy, University of Illinois, Chicago, Ill.,
OSCAR OLDBERG, School of Pharmacy, Northwestern University, Chicago, Ill.,
H. M. WHELPLEY, St. Louis College of Pharmacy, St. Louis, Mo.,
E. A. RUDDIMAN, School of Pharmacy, Vanderbilt University, Nashville, Tenn.,
A. B. HUESTED, Albany College of Pharmacy, Albany, N. Y.,
W. C. ANDERSON, Brooklyn College of Pharmacy, Brooklyn, N. Y.,
G. M. BERINGER, Camden, N. J.,
G. B. KAUFFMAN, School of Pharmacy, University of Ohio, Columbus, Ohio.,
C. M. FORD, Denver College of Pharmacy, Denver, Colo.,
J. A. KOCH, School of Pharmacy, Western University, Pittsburg, Pa.,
F. J. WULLING, School of Pharmacy, University of Minnesota, Minneapolis, Minn.,
C. A. MAYO, Chairman, New York City.

CARNEGIE INSTITUTION OF WASHINGTON, D. C., *December 18, 1902.*

CASWELL A. MAYO, ESQ., *62 West Broadway, New York City.:*

*Dear Sir:* The Executive Committee has considered the address from the Committee of the American Pharmaceutical Association, and has decided that it is not expedient, at the present time, to establish an Advisory Committee on Pharmaceutical Research.

Yours truly, CHAS. D. WALCOTT, *Secretary.*

Mr. Remington moved to accept the report and refer for publication, and the motion prevailed.

The Chair called upon the secretary to read the following as the report of the Committee on Time and Place of Next Meeting:

The Committee on Time and Place of Next Meeting, after considering the invitations from St. Louis, Put-in-Bay and Kansas City, decided in favor of Kansas City, and advises that the time of meeting be left to the Council.

E. G. EBERLE, *Chairman,*
C. S. N. HALLBERG,
OTTO. F. CLAUS,
J. W. T. KNOX,
WM. L. CLIFFE.

Mr. Sayre, seconded by Mr. Remington, moved the adoption of the report as read, and the motion was adopted with applause.

The report of the Committee on Weights and Measures was next called for, and Mr. Ryan read the following:

## REPORT OF THE SPECIAL COMMITTEE ON WEIGHTS AND MEASURES.

*To the President and Members of the American Pharmaceutical Association:*

The bill providing for the adoption of the Metric System in all departments of the government was withdrawn from the House of Representatives by the friends of the measure when it became apparent that the bill could not pass at the last session of Congress. The plan of the advocates of the measure will be to introduce it simultaneously in both Houses next December, and to endeavor to secure favorable reports by both committees during the long session. The bill passing either House can then be substituted in the other, and much time be saved.

At the meeting of the National Association of Manufacturers, held at New Orleans, a committee appointed for the purpose reported the results of its investigations embodying replies to the questions sent to members of the Association, and concludes as follows: "It would seem to be quite clear from the analysis of replies received from the members of the Association that the prevailing sentiment is adverse, at least to the bill which was favorably reported to the House during the session of Congress." As previously reported by your committee, the most active opposition comes from mechanical engineers, because of changes which would be made necessary in standard tools, screw threads, etc. While your committee cannot report any positive advance toward the final adoption of the Metric System during the past year, the discussion which has been aroused has done much to place on record those in favor of and those opposed to the proposition, and to make a definite conclusion possible in the near future.

Respectfully submitted, F. G. RYAN, *Chairman.*

Mr. Remington moved to adopt the report as read.

Mr. Mayo moved to amend by also continuing the committee. Mr. Wilbert seconded the motion as amended, and it was put and carried.

The chair called for the report of the Committee on Model Pharmacy Law, Mr. J. H. Beal, chairman. The Secretary announced that the chairman had said the report was ready, but it had not been sent in as yet. Mr. Mayo moved to refer to the Committee on Education and Legislation, which motion was seconded by Mr. Hallberg, and carried.

Mr. Hallberg, at the request of the chair, then read and submitted the following as the report of Delegates to American Medical Association.

## REPORT OF DELEGATES TO THE SECTION ON MATERIA MEDICA, PHARMACY AND THERAPEUTICS OF THE AMERICAN MEDICAL ASSOCIATION.

The annual session of this Association, held in New Orleans in May, was attended by over 2,000 members. Of the meetings of the twelve sections, that on Materia Medica, Pharmacy and Therapeutics was of especial interest to pharmacists.

At the last annual session in Saratoga several papers of such unusual interest were read that they were referred to special committees to report on. They were, "The Dosage of Liquid Medicines and the Metric System," by C. S. N. Hallberg, of Chicago; "Nerve Nostrums," by W. P. Spratling, N. Y.; and "Drug Addictions," by S. E. Jelliffe, N. Y. After an exceedingly able address by the chairman, Dr. Solomon Solis-Cohen, Philadelphia, the reports of the committees were presented, after which the following resolutions were passed and subsequently presented to the House of Delegates, the governing body of the Association:

### ON DOSAGE OF LIQUID MEDICINES.

*Resolved*, That teachers of medicine and pharmacy, editors of medical and pharmaceutical journals and authors of text-books are respectfully requested to give precedence to the metric method in the writing of all medical formulas, and that, for the administration of doses of less than a teaspoonful, the quantity be stated in drops delivered from a standard medicine-dropper or pipette, of three millimeters external diameter, which will deliver twenty drops of water at 15° C., which will measure one cubic centimeter when dropped at the rate of one per second; and that the teaspoonful be considered as equivalent to five cubic centimeters, and that the tablespoonful be considered as equivalent to fifteen cubic centimeters; and,

*Resolved*, That the orthography, abbreviations, etc., of the International Bureau, or the same as revised by the National Bureau of Standards at Washington, shall also be recommended for adoption in medical and pharmaceutical publications; and,

*Resolved*, That a copy of these resolutions be transmitted to the Committee of Revision of the United States Pharmacopœia for 1900, with the request that they be incorporated as far as possible in the United States Pharmacopœia.

### ON "NERVE REMEDIES" AND DRUG ADDICTION.

In view of the spread in the growth of the use and abuse of proprietary remedies the Section recommends:

1. That newspapers which do not print objectionable medical advertisements are entitled to, and should receive, the favor and preference of medical men.

2. That articles on the dangers arising from the use of quack nostrums should be written for such newspapers for publication.

3. That the Committee on National Legislation be asked to consider the feasibility of the introduction in the next House of Representatives of an inter-state measure prohibiting or limiting the sale of poisonous and dangerous patent medicines.

4. That no medicinal preparation for internal use, as distinguished from antiseptics, disinfectants, cosmetics and dietetics, advertised as a remedy or cure to the laity, is entitled to the patronage of physicians, nor should such be admitted to the pages of the medical journals, nor to the exhibitions of the American Medical Association.

5. That manufacturers be requested to print the scientific or chemical names under the trade name of all pharmaceutical or chemical preparations.

6. That the general plan and object of the National Bureau of Medicines and Foods are entitled to a further careful investigation by a special committee of the American Medical Association.

A series of papers of especial scientific interest to pharmacists as well as physicians were presented, of which the following are abstracts:

"Is Pharmacologic Action Determined by Chemical Structure or by Physical Characters?" by Arthur R. Cushny, Ann Arbor, Mich.

The view is generally expressed that a close relation exists between the configuration of a molecule and its effects in the organism. The modern study of the borderland between chemistry and physics has suggested a doubt how far pharmacologic effects are due to chemical combination between living substance and drugs, and how far they may be accounted for by the physical characters of drugs. It will be shown that in some instances the latter view is the more satisfactory. There is every evidence, further, that some inorganic bodies differ in their effects, not through differences in their chemical affinities for living matter, but rather through the differences in their physical properties. The conclusion is drawn that undue weight has hitherto been laid on the constitutional structure of drugs, and that, while this may give important indications as to the effects of drugs, it seems probable that more direct inferences can be drawn from a knowledge of the physical characters.

"Research Problems of Pharmacology," by Torald Sollmann, Cleveland, O.

The desirability of a more general participation in pharmacologic research by the profession. 1. The problems which pharmacology must answer to supply a scientific basis for rational therapeutics. The part which professional pharmacologists, clinicians, synthetic and pharmaceutic chemists, hospitals and laboratories should take. 2. Theoretical problems which pharmacology must investigate to answer the ultimate questions of biology. The need of a cellular and comparative pharmacology. 3. Organization of research. Training required for research. Steps to be taken to acquire this training. Attitude of medical societies to pharmacologic research.

Of the delegates appointed by President Payne from the American Pharmaceutical Association to the Section there were present: Caswell A. Mayo (N. Y.), C. S. N. Hallberg, Chicago, and A. K. Finlay, G. C. Godbold, C. L. Keppler, A. L. Metz and Max Samson, of New Orleans. The delegates were welcomed by the chairman, and Mr. Mayo responded on behalf of the A. Ph. A. in a felicitous manner, He briefly reviewed the work done by the two associations along the same lines, notably the investigations into drug addictions, for which an especial committee was maintained.

On motion of Dr. W. J. Robinson (N. Y.) it was ordered that delegates be appointed from the Section to attend the A. Ph. A., the chairman appointing W. J. Robinson (N. Y.), H. R. Slack (Ga.), W. W. Tompkins (W. Va.), H. N. Leavall (Ky.) and C. S. N. Hallberg (Chm.).

A resolution was passed instructing the delegates to present an amendment to the Constitution providing for pharmaceutical membership in the American Medical Association. The House of Delegates approved the proposition and the Constitution was changed, making pharmacists members upon the recommendation of the officers of the Section on Materia Medica, Pharmacy and Therapeutics, and a two-thirds vote of the Section.

"The Chemistry of Ergot" was the title of a paper on the programme which was to

be read by Dr. A. B. Lyons (Mich.), but who, unfortunately was detained at home. Under the rules no papers can be read in the absence of the author, although the Section may vote to make an exception, but no paper will be published as read before the Association except it be certified as having been read by the Secretary of the Section and approved by the Executive Committee, consisting of the three last retiring chairmen of the Section.

A paper "On Mercury" was read by Laura House Branson (Ia.), followed by symposia "On Diabetic Diet" and "Alcohol."

A paper on "Intestinal Antiseptics, Their Uses and Limitations," read by J. A. Storck (La.), was also of considerable pharmaceutical interest. "The U. S. Pharmacopœia of 1900," a review of the work of the Committee on Revision, read by C. S. N. Hallberg, created considerable discussion, and a paper "On Spurious Creosotes," read by C. A. Mayo (N. Y.), evoked the following resolution:

"*Resolved*, That the term 'Creosote' should be restricted solely to true wood-tar creosote, owing to the great danger arising from the present indiscriminate use of the term; and prescribers are requested to specify beech-tar creosote in order to properly distinguish the article from coal-tar creosote."

The paper which, however, created the most interest and the liveliest discussion was read by Dr. W. J. Robinson (N. Y.), entitled "The Composition of Some of the So-called New Synthetics." The paper was referred to a committee, which presented the following memorial, which was afterwards approved by the Section:

1. That, inasmuch as the primary cause of the proprietary medicine evils is the lack of knowledge on the part of medical graduates, the course in materia medica should be supplemented during the last year, in connection with therapeutics, by a course on pharmacy especially designed to qualify the student to formulate his own prescriptions in the most eligible manner.

2. A closer adherence to the United States Pharmacopœia and the National Formulary as a basis for text-books and instruction will lead to a greater appreciation of the official drugs and chemicals and formulas of the recognized medical authorities.

3. That some well-considered plan should be inaugurated for the differentiation of the thousands of medicinal articles and specialties to remove the present existing confusion among physicians and pharmacists alike, and to afford some kind of criteria as to their ethical status, and to separate the true from the false.

4. That the revision of the patent laws as applied to medicines, trademarks and copyrights should be demanded.

5. That the primary object of a medical journal published by medical men or societies should be to chronicle the work of the profession it represents and the general diffusion of medical knowledge, and not for the purpose of making money, commercial gain, through the advertising privileges being derogatory to the profession.

6. It is recommended that a committee of competent persons be appointed to act as an advisory board in determining the limitations and privileges of advertisements appearing in the Journal and in the exhibits of the American Medical Association.

On motion, the following were constituted a committee to consider the subject comprised in Dr. Robinson's paper, and the recommendations in the following memorial, to report at the next annual session: "Dr. Henry A. Moody, Mobile, Ala.; Dr. Wm. J. Robinson, New York, and C. S. N. Hallberg, Chicago, Ill.

The Nominating Committee reported the following for officers for the year: Oliver T. Osborne, Yale Medical School, New Haven, Conn., chairman; C. S. N. Hallberg, Chicago, secretary; Dr. Wm. J. Robinson, New York, delegate. The report was approved and those named were elected.

The Section, after reading and discussing some twenty papers, receiving and acting upon several reports and planning for the important work of the Section in an endeavor

to correct some of the pharmaceutic abuses from which the medical profession is suffering, adjourned, to meet in Atlantic City in June, 1904.

Respectfully submitted, C. S. N. HALLBERG, *Chairman.*

The report was received with favor, and Mr. Remington moved to adopt.

MR. REMINGTON: In moving the adoption of that report I want to say a few words. I was one of those who were instrumental in the beginning in establishing cordial relations between the American Medical Association and the American Pharmaceutical Association, and in getting together a delegation and visiting the American Medical Association. I want to congratulate our two delegates, Mr. Hallberg and Mr. Mayo, who have done such excellent work and represented the American Pharmaceutical Association so worthily on this occasion. And it is a great gratification to me to hear the good news that the American Medical Association is now prepared to receive pharmacists on the basis of membership, and has extended the right hand of fellowship, as it should have done years ago. It has been a long time coming, but I congratulate the members on the good work they have done, and I think we all ought to be congratulated on this very desirable change in the relations between medicine and pharmacy. (Applause.)

Mr. Remington's motion was seconded by Mr. Wilbert and carried.

The Chair asked if any committee had been overlooked, but there was no response.

The Chair then recognized Mr. Sayre, of Kansas, and that gentleman read and offered the following resolutions:

*Resolved*, That it is for the interest of American pharmacy that a standard antitoxin for determining the strength of anti-diphtheritic serum be provided in this country.

*Resolved*, That the American Pharmaceutical Association respectfully requests the United States Public Health and Marine Hospital Service to establish and maintain such a standard serum for the use of investigators, manufacturers and individuals who may have need for such.

The resolutions were seconded by Mr. Remington and Mr. Roehrig.

MR. REMINGTON: I think this a very desirable move. I am sorry it did not come up when there were more members present. The Pharmacopœia Committee have been considerably embarrassed about this question of a standard antitoxin, and I will say that when a special committee was organized to look into this matter very carefully they discovered there was difficulty in establishing a standard. There is no standard for this country. Most of the manufacturers use Ehrlich's standard, which is practically adopted by the German Pharmacopœia. We could not adopt that standard in this country, and we should have a standard of our own; and in requesting the Marine Hospital Service to take this work up I will say that they have a well-equipped laboratory, and they are the furthest along and best equipped of any department of the government for establishing a standard. It would be an encouragement to the government, and particularly Dr. Roseneau and Surgeon-General Wyman, of the Marine Hospital Service, for this body to take action, and I very cordially approve the resolution, and hope it will be adopted.

MR. ROEHRIG: I want to back up Mr. Remington's remarks on the laboratory. I have seen it grow from a small affair until it has assumed wonderful proportions, and they have now built a magnificent building and are prepared to attend to anything of that kind. I believe Surgeon-General Wyman will be only too glad to have this matter referred to him.

MR. RYAN: I believe the resolution would meet the hearty approval of all those engaged in the industry of making antitoxin.

THE PRESIDENT: I am glad to know that, and what we have heard here is certainly in harmony with the strenuous efforts we have been making for some time past for a better understanding between the government and pharmacists.

A vote on the resolutions was then had, and they were adopted without dissent.

The Secretary called attention to the enthusiasm with which Mr. Hancock, of Baltimore, had spoken in regard to the late William Procter at the Philadelphia meeting, and said he had asked to have a paper read before the Association at this meeting, but as there were so few members present, and the hour was so late, it would be better, he thought, to defer it until the last session on Saturday morning.

Mr. Mayo asked if the paper could be properly read before the Historical Committee at its meeting this evening, and the Secretary said he thought it could.

The Chair invited any announcements that it might be desired to make, but no one responded.

Upon motion of Mr. Remington, the Association then adjourned.

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THIRD SESSION—TUESDAY AFTERNOON, AUGUST 4, 1903.

No business was transacted by the Association previous to the session of the Section on Commercial Interests.

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FOURTH SESSION—TUESDAY EVENING, AUGUST 4, 1903.

No business was transacted previous to the session of the Historical Committee.

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FIFTH SESSION—WEDNESDAY MORNING, AUGUST 5, 1903.

No business was transacted previous to the first session of the Section on Scientific Papers.

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SIXTH SESSION—WEDNESDAY EVENING, AUGUST 5, 1903.

No business was transacted previous to the second session of the Section on Scientific Papers.

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SEVENTH SESSION—THURSDAY MORNING, AUGUST 6, 1903.

No business was transacted previous to the first session of the Section on Practical Pharmacy and Dispensing.

### Eighth Session—Thursday Afternoon, August 5, 1903.

No business was transacted previous to the second session of the Section on Practical Pharmacy and Dispensing.

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### Ninth Session—Friday Morning, August 7, 1903.

No business was transacted previous to the first session of the Section on Pharmaceutical Education and Legislation.

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### Tenth Session—Friday Evening, August 7, 1903.

No business was transacted previous to the second session of the Section on Pharmaceutical Education and Legislation.

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### Eleventh Session—Saturday Morning, August 8, 1903.

The eleventh general session was called to order at 10:45 a. m., by President Payne, who announced that the first order of business was the reading of the minutes of the second general session.

The Secretary read the minutes accordingly, which, upon motion of Mr. Eberle, were ordered approved as read.

The chair then called for the reading of the minutes of the Council's transactions since the last report, and Secretary Whelpley read the minutes of the fifth session.

#### Fifth Session of the Council—August 5, 1903.

The Council was called to order at the Grand Hotel, 9:30 a. m., by Chairman Beal.

On roll call the following members responded: Alpers, Beal, Beringer, Caspari, Cliffe, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Sheppard, Whelpley, the absentees being, Baker, Diehl, Payne, Rapelye, Schlotterbeck, Willis.

The reading of the minutes of the fourth session of the Council was dispensed with, as they had already been approved by the Association.

On motion by W. C. Alpers, seconded by G. M. Beringer, nine applications for membership were referred to the general session with the recommendation that they be invited to complete their membership.

On motion by C. B. Lowe, seconded by S. A. D. Sheppard, it was decided to have the Council meet at 9 a. m., Thursday, August 6, to hear a discussion on the National Bureau of Medicines and Foods by the parties interested in the subject.

On motion by Charles Caspari, Jr., seconded by H. M. Whelpley, the salary of the stenographer was made $200 per annum.

A communication from W. M. Searby relative to the method of electing new members was referred to the Committee on Membership.

On motion by S. A. D. Sheppard, seconded by C. S. N. Hallberg, Rule 14 of the Rules on Finance was stricken out, and Rule 15 made Rule 14.

On motion by J. F. Patton, seconded by L. C. Hopp, the Council adjourned to meet 9 a. m., Thursday, August 6.

Upon motion of Mr. Hancock, seconded by Mr. Anderson, the minutes just read were approved.

Mr. Whelpley read the minutes of the sixth session of the Council:

SIXTH SESSION OF THE COUNCIL—AUGUST 6, 1903.

The Council was called to order promptly at 9 a. m. by Chairman Beal.

The new members of the Council, many visitors and the following members of the Council were present: Alpers, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Payne, Perry, Schlotterbeck, Sheppard, Whelpley, Wooten. The absent members of the Council were: Baker, Rapelye, Willis.

The minutes of the fifth session of the Council were read and approved.

On motion by T. V. Wooten, seconded by J. O. Schlotterbeck, seven applications for membership were referred to the general session with the recommendation that they be invited to complete their membership.

On motion by H. M. Whelpley, seconded by L. C. Hopp, Joseph G. Wirthman, of Kansas City, was made local secretary for the meeting of 1904.

On motion by L. C. Hopp, seconded by J. F. Patton, the following special report of the Committee on Membership was approved:

"Moved by Charles Caspari, Jr., and seconded by W. L. Cliffe, that it is the sense of the Committee on Membership that applications for membership should be received and acted upon at any time during the year. Motion carried unanimously.

"Moved by S. A. D. Sheppard and seconded by W. L. Cliffe, that it is the sense of the Committee on Membership that the By-Laws should be so amended that all applications for membership shall be acted upon by the Council, without subsequent reference to the Association. Motion carried unanimously. Present at the committee meeting were: L. C. Hopp, S. A. D. Sheppard, Charles Caspari, Jr., W. L. Cliffe, G. M. Beringer, E. G. Eberle."

On motion by S. A. D. Sheppard, seconded by H. M. Whelpley, the following amendments to the By-Laws were indorsed by the Council, so that they will conform to the recommendations made in the above special report of the Committee on Membership:

"Amend Section 5 of Article xiii, Chapter VIII, of the By-Laws by striking out all after the word 'shall' and inserting the following: 'report at the annual meeting the names of all newly-elected members.'

"Amend Article iv, Chapter VIII, by striking out the words: 'act on the report of Council on membership.'

Change Article ii, Chapter VII, of the By-laws to read as follows: "Every application for membership shall require the endorsement of two members of the Association in good standing and each applicant must receive the affirmative vote of three-fourths of the members of the council for election, after which his membership shall be completed by his signing the Constitution and By-laws and paying the annual dues for the current year. Any applications for membership made prior to March 1 shall be considered as of the current fiscal year."

The secretary read the report of the Committee on National Bureau of Medicines and Foods which had been referred to the council by the general session.

Chairman Beal announced that if satisfactory to the council, one hour and a half would be set apart for the consideration of this report, one hour to be given to the negative and thirty minutes to the affirmative. F. G. Ryan spoke for the negative and called upon A. B. Lyons of the committee to speak as a member of the committee. Further remarks for the negative side were made by C. B. Lowe, W. C. Anderson, Chas. E. Dohme, J. M. Good, H. M. Whelpley, Joseph Helfman, C. A. Mayo, Chas. G. Merrell, G. M. Beringer. The affirmative was represented by H. H. Rusby, C. S. N. Hallberg, W. C. Alpers, P. M. Jones, Geo. F. Payne.

A motion to adjourn was lost. The council then went into executive session.

On motion by C. Lewis Diehl seconded by C. S. N. Hallberg, a sub-committee of three members of the council was named by the chair to consider the subject of the National Bureau of Medicines and Foods and to report at a subsequent session of the council. The chair named Messrs. Diehl, Hallberg and Whelpley.

On motion the council adjourned.

Mr. Ryan moved to approve as read. Seconded by Mr. Dohme and carried.

Mr. Whelpley read the minutes of the seventh session.

SEVENTH SESSION OF THE COUNCIL—AUGUST 7, 1903.

The Council was convened at the Grand Hotel at 9 a. m. by Chairman Beal. The following members were present: Alpers, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Payne. Perry, Schlotterbeck, Sheppard, Whelpley, Wooten. The absentees were Baker, Patton, Rapelye, Willis. The minutes of the sixth session of the Council were read and approved.

The following communication was read:

MACKINAC ISLAND, *August 5, 1903.*

MR. CHARLES CASPARI, JR., *Secretary.*

*Dear Sir:* Appreciating as a publisher the great value to the pharmaceutical press of the proposed Index of the Proceedings of the Association for the past fifty years, and realizing that the expense of printing this Index might be quite a serious item to the carefully conserved treasury of the Association, I offer on behalf of the "Druggists' Circular" to be one of four to assume the cost of printing said Index, and agree to advertise and push the sale of it without charge or profit.

While this offer is made on the condition that at least three other publishers join in the guarantee, the publisher of each and every pharmaceutical journal having affiliations with the Association is invited to participate in the printing of this work, which will certainly greatly aid and facilitate the work of editors, students, writers and others interested in pharmacy. I have discussed my suggestion with other members of the pharmaceutical press present, and believe that without an exception they will all be glad in this way to display their good will and show their interest in the American Pharmaceutical Association.

Respectfully yours, WILLIAM C. ALLISON, *Publisher of the Druggists' Circular.*

On motion of S. A. D. Sheppard, seconded by C. B. Lowe, the above proposition was accepted, and referred to the Committee on Publication for action.

On motion by C. B. Lowe, seconded by L. C. Hopp, a vote of thanks was extended to Mr. William O. Allison and other parties interested in making the above proposition.

On motion by C. B. Lowe, seconded by E. G. Eberle, a special committee, consisting of S. A. D. Sheppard, W. C. Alpers and L. C. Hopp, was named to consider and report on the advisability of offering membership in the A. Ph. A,, as prizes to college graduates.

On motion by W. C. Alpers, seconded by W. L Cliffe, nine applications for membership were referred to the general session, with the recommendation that the applicants be invited to complete their membership.

On motion by H. M. Whelpley, seconded by J. F. Patton, the Committee on Publication was instructed to publish the picture of George W. Kennedy as a frontispiece to the Proceedings for 1903.

C. Lewis Diehl read the following report of the special committee to consider the subject of a National Bureau of Medicines and Foods:

Since the Association has adopted a resolution favoring the formulation of some plan for remedying the conditions outlined in the preamble to a series of resolutions reported by a joint committee of the A. M. A. and A. Ph. A., at the second general session, the Council to whom these resolutions were referred for consideration, although not knowing of a plan whereby this desirable object may be attained, neverthe-

less, in a spirit of fairness to the joint committee, advises the adoption of the resolutions and definition of principles embodied in the report of said joint committee.

[Signed] C. S. N. Hallberg,
H. M. Whelpley,
C. Lewis Diehl, *Chairman.*

On motion, action on the above report was postponed until next session of the council.

On motion, the council adjourned to 9: 30 p. m.

That part of the minutes referring to the generous proposition of five leading publishing houses to publish the semi-centennial index was applauded. The chair called for action on the minutes, and upon motion of Mr. Eberle, seconded by Mr. Eliel, they were ordered approved as read.

Mr. Wooten: It seems to me we should know the names of the pharmaceutical journals whose generosity has placed us in such a desirable position as to the publication of the collective index.

Mr. Whelpley: This information is not in the hands of the Council. Mr. Allison said four other publishing houses would join with him, and doubtless others would join them in doing this work.

The President: I think it would be in order to express our appreciation of the kind offer of these five journals, even if we do not know their names.

Mr. Whelpley: That is done in the minutes of the Council.

Mr. Whelpley then read the minutes of the eighth session of the Council.

Eighth Session of Council—August 7, 1903.

The Council was called to order at the Grand Hotel at 9: 30 p. m. by Chairman Beal.

The following members were present: Alpers, Beal, Beringer, Caspari, Cliffe, Diehl, Eberle, Hallberg, Hopp, Knox, Lowe, Patton, Payne, Perry, Sheppard, Whelpley, Wooten. The absentees were: Baker, Rapelye, Schlotterbeck, Willis.

On motion by F. W. R. Perry, six applications for membership were referred to the general session, with the recommendation that the applicants be invited to complete their membership.

As a special order of business, the Council considered the report of the Special Committee on National Bureau of Medicines and Foods. The report was discussed by Messrs. Sheppard, Beringer, Hallberg, Alpers, Caspari, Lowe and Wooten. C. B. Lowe offered the following substitute for the report under consideration:

*Resolved*, That the committee of five previously appointed by the Association, viz., Messrs. Rusby, Lyons, Alpers, Hallberg and Good, be made a committee of the Council, and be instructed to report their plan to the Council ad interim, the final vote upon the plan to be deferred to the meeting of the Council at Kansas City in 1904. We would also suggest to the committee that they should endeavor to report the plan to the American Medical Association at their next annual meeting.

This was seconded by J. F. Patton and discussed by Charles Caspari, Jr., L. C. Hopp, S. A. D. Sheppard, C. S. N. Hallberg, W. C. Alpers, J. F. Patton and J. P. Remington, the latter being present as a visitor.

On vote the substitute was adopted,

W. C. Alpers reported for the Special Committee on Membership as follows:

Your committee recommends that, for the purpose of increasing our membership from

the ranks of college graduates, we invite the pharmaceutical colleges of the United States and Canada to award prizes to deserving students, consisting of the payment of one or more years' membership in the A. Ph. A., with the understanding that the Association will allow an equal amount in dues as that awarded by the colleges if the person shall be accepted as a member.

"We also recommend that blank certificates be prepared, testifying to the awarding of such prizes, and offered to all colleges that wish to use them at a nominal price."

On motion, the report was adopted.

On motion, the Council adjourned.

The chair called for action on the minutes, and Mr. Cliffe, seconded by Mr. Dohme, moved to approve.

Mr. Ebert called for the reading of the minutes again on the proposition to give memberships to colleges as prizes, and Mr. Whelpley read that part the second time.

After considerable discussion of the Council committee's report on the offer of memberships as prizes by colleges, by Messrs. Ebert, Lowe, Mayo, Sheppard, Whelpley, Kremers, Eliel, F. T. Gordon, L. E. Sayre, Hallberg and Diehl, on motion of Mr. Sheppard, duly seconded, the minutes were approved, except that section referring to the offer of memberships as prizes.

MR. HALLBERG: Now, Mr. President, I move that the question of offering memberships in this Association by colleges of pharmacy as prizes to their graduates, be referred to the Committee on Membership, to report a carefully prepared and well digested plan at the next annual meeting.

Mr. Eliel seconded this motion, and the chair put the question to an aye-and-no vote, and the ayes seemed to have it, but a division was called for, when the vote showed 38 voting in the affirmative and 8 in the negative. The chair thereupon declared the motion of Mr. Hallberg carried.

Mr. Whelpley read the minutes of the first session of the new Council.

FIRST SESSION OF THE NEW COUNCIL—AUGUST 8, 1903.

The new Council met at the Grand Hotel at 9:30 a. m., and proceeded to organization.

On roll call, the following members were present: Geo. F. Payne, Leo Eliel, J. H. Beal, Chas. Caspari, W. C. Alpers, C. L. Diehl, C. S. N. Hallberg, E. G. Eberle, C. B. Lowe, J. F. Patton, L. C. Hopp, W. A. Puckner, S. A. D. Sheppard, H. M. Whelpley, W. L. Dewoody; the absentees being W. H. Burke, A. M. Roehrig, H. B. Mason, J. P. Wirthman, C. A. Rapelye, and O. F. Claus.

The following officers were duly elected:

*Chairman*—J. H. Beal, Scio, O.

*Vice-Chairman*—Leo. Eliel, South Bend, Ind.

*Secretary*—H. M. Whelpley, St. Louis, Mo.

The Secretary read the minutes of the seventh and eighth sessions of the old Council, which were approved.

On motion by E. G. Eberle, seconded by L. C. Hopp, four applications for membership were referred to the general session, with the recommendation that the applicants be nvited to complete their membership.

On motion by J. F. Patton, seconded by E. G. Eberle, the bill of President Geo. F. Payne for $84.98, covering incidental expenses, was approved.

On motion by S. A. D. Sheppard, seconded by H. M. Whelpley, the first Monday of September, 1904, was fixed as the date of the fifty-second annual meeting, at Kansas City, Mo.

Chairman Beal nominated the following committees:

*Membership*—Claus, Eberle, Payne, Roehrig, Burke, Sheppard, Puckner, Caspari, Whelpley.

*Finance*—Rapelye, Lowe, Patton.

*Publication*—Caspari, Diehl, Alpers, Hallberg, Mason.

*Centennial Fund*—Hopp, Rapelye, Caspari.

*Auditing Committee*—Lowe, Hancock, McIntyre.

*Transportation*—Caspari, Ebert, Mayo, Ford, Merrell, Sheppard, Watson, Whelpley, Searby, Frost, Samson.

The Chairman then announced a recess, and instructed the committees to select their chairmen. After re-assembling, the following chairmen were announced:

*Membership Committee*—O. F. Claus, chairman.

*Finance Committee*—C. A. Rapelye, chairman.

*Publication Committee*—Charles Caspari, Jr., chairman.

*Committee on Centennial Fund*—Lewis C. Hopp, chairman.

*Auditing Committee*—C. B. Lowe, chairman.

*Transportation Committee*—Charles Caspari, Jr., chairman.

On motion by S. A. D. Sheppard, seconded by W. L. Dewoody, the Council adjourned.

Mr. Anderson, seconded by Mr. Dohme, moved to approve.

MR. GOOD: I would like to speak in regard to the time of holding our next meeting. I can see why it would be the desire of the Council to defer the date of the meeting as long as possible—to as late a date as possible; but, unfortunately, you cannot put it far enough off to insure cool weather. My observation in thirty years' residence in that latitude is that it is just as likely to be hot in Kansas City the first week in September as the last week in August, and by holding our meeting the first week in September we rule out a great many who might otherwise attend the meeting. I move, therefore, that we strike out the first week in September and insert the last week in August. I move to amend the minutes of the Council so that the time of meeting will be the last Monday in August, instead of the date mentioned.

MR. ALPERS: I believe the Association is hardly ready to decide this question now. Therefore, I move, as a substitute to the motion just made, that this question be referred to a special committee of three, consisting of the General Secretary, the Local Secretary for our Kansas City meeting and the Secretary of the Council.

MR. SHEPPARD: Gentlemen, this matter is very simple. It is the old, old story, and I think we should get rid of it entirely. The question of time of meeting was thoroughly threshed out in the Council. The proposition of heat is an unknown quantity, of course; but the question of a date so far as the end of the month is concerned is one that affects business men very generally throughout the country. The last week in August would bring our meeting to cover the last two or three days in August and first three or four days in September, which is a critical time in the store for the business man, whereas the 5th of September will allow the business man to clean up his end-of-the-month's work and then come on to the meeting. If you make the date the 12th of September, it will interfere with the college men. The matter was thoroughly considered by the Council, and I believe we should stand by its action.

MR. WHELPLEY: Speaking to Mr. Alpers' proposed amendment, I would say that I am confident, in case it carries, the committee he suggests will immediately report in favor of the first Monday in September. So we may just as well adopt that date and be done with it, so far as the three Secretaries are concerned.

The chair then put the vote on the motion of Mr. Alpers as an amendment to that of Mr. Good, and the motion was lost.

MR. GOOD: My motion was, to substitute the last Monday in August for the date recommended by the Council.

MR. DEWOODY: The last days of August and first days of September will be very inconvenient for business men generally, and I hope the Association will vote down the motion of Mr. Good.

MR. GOOD: After all that has been said, I think it would probably be wise to make the date the third Monday in August, instead of the last Monday, and with the permission of the chair I will change my motion so as to make it the third Monday in August.

MR. HOPP: I hope that motion will not prevail, for the simple reason that you will not get the men from the Northern part of the country to go down to St. Louis and Kansas City in August.

MR. SHEPPARD: I remember that our last meeting at Kansas City stands out as something terrible for heat. It exceeded Baltimore in '98. All our men went there in their shirt-sleeves—they couldn't stand the heat. Now let us give Kansas City a chance to redeem herself. (Laughter.)

MR. WHELPLEY: This date of September 5th was carefully considered and decided upon after consultation with the delegation from Kansas City. Kansas City, like St. Louis, is a convention city, and they have no important convention there for the week beginning September 5th, and these people are heartily in favor of that date.

The chair then put the motion of Mr. Good to substitute the third Monday in August as the date of meeting to a vote, and the motion was lost.

The original motion to approve the minutes of the Council as read was then put, and carried.

Mr. Whelpley then offered the following:-

Moved by H. M. Whelpley and seconded by S. A. D. Sheppard that Local Secretary J. S. Wirthman be designated as Chairman of the Committee on Arrangements for the 1904 meeting, and be instructed to name his associates on the committee and report the names to the General Secretary for publication in the Proceedings.

This motion was seconded by Mr. Cliffe, and carried.

MR. WHELPLEY: Mr. Chairman, the Council has recommended to the Association 34 applicants for membership that have not been acted on. I move that these applicants be now invited to complete their membership in the Association. This makes a total of 199 applications for membership at this meeting. [Applause.]

The motion was put and carried unanimously.

Mr. Mason, of Detroit, here took the floor to say that he had been instructed by the Section on Education and Legislation, of which he was

Secretary, to present to the general session two or three resolutions which he thought might come in here. Two of them, he said, referred to this question of membership discussed on the floor this morning. One of them was, that the general session adopt a motion providing for the appointment of a committee to consider and report at the 1904 meeting upon a plan for the organization of local branches of the American Pharmaceutical Association. Mr. Mason moved that such a step be taken. The motion was seconded by Mr. Fennel, and carried.

Mr. Mason then presented another resolution upon the subject of membership, to the effect that the general session be requested to change the name of the General Committee on Membership to that of General Committee on Membership and Reception, the idea being that the general committee should receive new members as they come into the meetings and extend the right-hand of fellowship to them. Mr. Mason moved the adoption of the resolution. Mr. Gordon seconded it, and it carried.

Mr. Mason said his third request from the Section was, that 1,000 reprints be ordered of the report of the Committee on Acquirement of Drug Habit. Mr. Hallberg seconded this motion, and it also prevailed.

The chair said if there were any delegates present from any State Associations who had any reports to make, the Association would be glad to hear from them—delegates who had not been heard from at the last general session. There was no response, and the chair called for the report of the Treasurer, which Mr. Sheppard presented as follows:

## REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, JULY 1, 1902, TO JULY 1, 1903.

### RECEIPTS.

| | | | |
|---|---|---|---|
| Cash on hand July 1, 1902 | | | $1,540 41 |
| Received from sale of 9 certificates at $7.50 | | | 67 50 |
| " " " 23 certificates at $5.00 | | | 115 00 |
| " " " Proceedings | | | 93 05 |
| " " " Badges and Bars | | | 65 00 |
| " " " National Formulary | | | 362 34 |
| " " " 500 reprints of Dr. Hoffman's Address | | | 20 00 |
| " " account of Ebert Fund | | | 28 00 |
| " " Committee on Exhibition | | | 950 16 |
| " " Committee on Semi-Centennial | | | 9 00 |
| " " Interest on Deposit in New England Trust Co., Boston | | | 95 46 |
| " " Bonds of General Fund, called in | | | 2,000 00 |
| " " Reinstatement fees | | | 25 00 |
| Received from Annual Dues, 1897 | $10 00 | | |
| " " " " 1898 | 15 00 | | |
| " " " " 1899 | 35 00 | | |
| " " " " 1900 | 180 00 | | |
| " " " " 1901 | 245 00 | | |
| " " " " 1902 | 3,365 00 | | |
| " " " " 1903 | 2,535 00 | | |
| " " " " 1904 | 15 00 | | |
| | | | 6,400 00 |

| | | | | |
|---|---|---|---|---|
| Received from Life Membership Fees, viz.: | | | | |
| Israel H. Shurtleff | | | $30 00 | |
| Edward W. Runyon | | | 30 00 | |
| Edward V. Zoeller | | | 30 00 | |
| | | | | 90 00 |
| Total | | | | $11,860 92 |

DISBURSEMENTS.

| | | | | |
|---|---|---|---|---|
| 1902. | | | | |
| August | 11. | Check 939. Wickersham Printing Co., Insurance. | | $6 88 |
| | 11. | Check 940. Nixon-Jones Printing Co., Printing and Stationery. | | 5 25 |
| | 11. | Check 941. C. H. Buck & Co.— | | |
| | | Committee on Transportation | $5 03 | |
| | | Printing and Stationery | 35 00 | |
| | | | | 40 03 |
| | 11. | Check 942. John S. Bridges & Co., Printing and Stationery. | | 61 60 |
| | 15. | Check 943. Chronicle Publishing Co., Printing and Stationery | | 27 25 |
| September | 9. | Check 944. Meyer Bros. Drug Co., Committee on Membership | | 11 25 |
| | 27. | Check 945. Henry Briele, Gold Badges and Bars | | 65 00 |
| | 27. | Check 946. Alpha Photo-Engraving Co., Proceedings | | 15 00 |
| | 27. | Check 947. James and Nydeggar, Printing and Stationery. | | 22 50 |
| | 27. | Check 948. Frank G. Ryan, Miscellaneous Expenses | | 14 72 |
| | 27. | Check 949. A. B. Prescott, Miscellaneous Expenses | | 3 11 |
| October | 9. | Check 950. William F. Kaemmerer, Section on Practical Pharmacy and Dispensing | | 25 00 |
| | 9. | Check 951. Chronicle Publishing Co., Printing and Stationery | | 21 25 |
| | 9. | Check 952. J. W. T. Knox— | | |
| | | Section on Education and Legislation | $1 74 | |
| | | Committee on Membership | 9 88 | |
| | | | | 11 62 |
| | 9. | Check 953. Henry M. Whelpley, Miscellaneous Expenses. | | 54 00 |
| | 9. | Check 954. James H. Beal, Miscellaneous Expenses | | 8 75 |
| | 9. | Check 955. S. A. D. Sheppard & Co., Miscellaneous Expenses | | 64 35 |
| | 9. | Check 956. Wickersham Printing Co.— | | |
| | | Proceedings | $11 50 | |
| | | National Formulary | 5 94 | |
| | | Printing and Stationery | 42 10 | |
| | | Miscellaneous Expenses | 4 77 | |
| | | | | 64 31 |
| | 18. | Check 957. J. G. McLean, Stenographer | | 150 00 |
| | 27. | Check 958. S. A. D. Sheppard, Traveling Expenses | | 48 40 |
| | 27. | Check 959. James H. Beal, Miscellaneous Expenses | | 7 75 |
| November | 10. | Check 960. Charles Caspari, Jr.— | | |
| | | Traveling Expenses | $51 28 | |
| | | National Formulary | 1 64 | |
| | | Proceedings | 13 73 | |
| | | Miscellaneous Expenses | 38 61 | |
| | | | | 105 26 |

| | | | | |
|---|---|---|---|---|
| | 10. | Check 961. George M. Beringer, Committee on Semi-Centennial Celebration | | $131 97 |
| | 10. | Check 962. Thomas McCarty, Committee on Semi-Centennial Celebration | | 46 47 |
| | 10. | Check 963. F. Pulaski & Co., Committee on Semi-Centennial Celebration | | 5 00 |
| | 10. | Check 964. H. R. Proper, Committee on Semi-Centennial Celebration | | 9 12 |
| | 14. | Check 965. John S. Bridges & Co.— | | |
| | | Printing and Stationery | $4 40 | |
| | | Semi-Centennial Index | 60 96 | |
| | | | | 65 36 |
| | 14. | Check 966. Dennison Manufacturing Co., Printing and Stationery. | | 5 00 |
| | 14. | Check 967. Hobbs & Warren Co., Printing and Stationery. | | 10 00 |
| | 22. | Check 968. Wickersham Printing Co.— | | |
| | | Proceedings | $25 85 | |
| | | National Formulary | 66 25 | |
| | | | | 92 10 |
| December | 22. | Check 969. S. A. D. Sheppard, first half-year's salary as Treasurer, 1902–1903 | | 375 00 |
| | 22. | Check 970. C. Lewis Diehl, first half-year's salary as Reporter on Progress of Pharmacy, 1902–1903 | | 375 00 |
| | 22. | Check 971. George W. Kennedy— | | |
| | | First half-year's salary as Secretary of Committee on Membership, 1902–1903 | $75 00 | |
| | | First half-year's salary as Secretary of Council, 1902–1903 | 75 00 | |
| | | | | 150 00 |
| | 22. | Check 972. Charles Caspari, Jr., First half-year's salary as General Secretary, 1902–1903 | | 500 00 |
| | 22. | Check 973. John S. Bridges & Co., Printing and Stationery | | 23 00 |
| | 22. | Check 974. Thorp & Martin Co., Printing and Stationery. | | 4 95 |
| | 22. | Check 975. Baltimore-Maryland Eng. Co., Proceedings | | 25 52 |
| 1903. | | | | |
| January | 1. | Check 976. William F. Kaemmerer, Enno Sander Prize | | 50 00 |
| | 8. | Check 977. J. O. Schlotterbeck and H. C. Watkins, Ebert Prize | | 28 00 |
| | 16. | Check 978. Baltimore-Maryland Eng. Co., Proceedings | | 62 00 |
| February | 17. | Check 979. William H. Bradford, Printing and Stationery. | | 45 00 |
| | 17. | Check 980. Wickersham Printing Company— | | |
| | | National Formulary | $23 00 | |
| | | Miscellaneous Expenses | 30 05 | |
| | | | | 53 05 |
| March | 12. | Check 981. Wickersham Printing Company, Miscellaneous Expenses | | 10 50 |
| | 12. | Check 982. J. O. Schlotterbeck, Proceedings | | 30 00 |
| | 12. | Check 983. Nixon-Jones Printing Company, Printing and Stationery | | 2 25 |
| | 12. | Check 984. Charles Caspari, Jr.— | | |
| | | Proceedings | $5 74 | |

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|---|---|---|---|---|
| | | National Formulary | 2 58 | |
| | | Journals | 44 20 | |
| | | Insurance | 10 00 | |
| | | Miscellaneous Expenses | 16 72 | |
| | | | | $79 24 |
| | 19. | Check 985. L. O. De Lashmutt, American Bonding and Trust Co., Premium on Treasurer's Bond | | 12 50 |
| | 19. | Check 986. John S. Bridges & Co., Printing and Stationery. | | 17 15 |
| April | 4. | Check 987. Baltimore-Maryland, Eng. Co., Proceedings. | | 141 50 |
| | 4. | Check 988. James H. Beal, Miscellaneous Expenses | | 6 53 |
| | 4. | Check 989. Nixon-Jones Printing Co., Printing and Stationery | | 19 15 |
| May | 12. | Check 990. Jones Commercial College, Miscellaneous Expenses. | | 5 00 |
| | 12. | Check 991. Wickersham Printing Co.— | | |
| | | Proceedings | $5 27 | |
| | | National Formulary | 21 58 | |
| | | Miscellaneous Expenses | 3 24 | |
| | | | | 30 09 |
| | 12. | Check 992. Wickersham Printing Co.— | | |
| | | Proceedings | $2,450 70 | |
| | | Printing and Stationery | 37 00 | |
| | | | | 2,487 70 |
| | 12. | Check 993. John S. Bridges & Co., Printing and Stationery. | | 12 25 |
| | 13. | Check 994. Baltimore-Maryland Eng. Co., Proceedings | | 7 00 |
| June | 11. | Check 995. C. Lewis Diehl, second half-year's salary as Reporter on Progress of Pharmacy, 1902–1903 | | 375 00 |
| | 11. | Check 996. S. A. D. Sheppard, second half-year's salary as Treasurer, 1902–1903 | | 375 00 |
| | 11. | Check 997. Henry M. Whelpley— | | |
| | | Salary as Secretary of Council, to Annual Meeting 1903 | $75 00 | |
| | | Salary as Secretary of Committee on Membership, to Annual Meeting 1903 | 75 00 | |
| | | | | 150 00 |
| | 11. | Check 998. Charles Caspari, Jr., second half-year's salary as General Secretary, 1902–1903 | | 500 00 |
| | 11. | Check 999. Wickersham Printing Company— | | |
| | | Printing and Stationery | $3 75 | |
| | | Proceedings | 706 19 | |
| | | | | 709 94 |
| | 11. | Check 1000. Nixon-Jones Printing Company, Printing and Stationery | | 14 50 |
| | 11. | Check 1001. Edgar L. Patch, Miscellaneous Expenses | | 5 36 |
| | 11. | Check 1002. John S. Bridges & Co., Printing and Stationery | | 2 75 |
| | 12. | Check 1003. Wickersham Printing Company, National Formulary | | 33 66 |
| | 22. | Check 1004. John S. Bridges & Company, Printing and Stationery | | 22 00 |
| | | | | $7,938 89 |

| | | | | |
|---|---|---|---|---|
| 1902. | | | | |
| November | 6. | Life Membership Fund, Israel H. Shurtleff | $30 00 | |
| 1903. | | | | |
| March | 3. | Life Membership Fund, Edward W. Runyon | 30 00 | |
| May | 27. | Life Membership Fund, Edward V. Zoeller | 30 00 | |
| | | | | 90 00 |
| | | | | $8,028 89 |

SUMMARY OF DISBURSEMENTS, JULY 1, 1902, TO JULY 1, 1903.

| | |
|---|---|
| Proceedings | $3,500 00 |
| Stenographer | 150 00 |
| Journals for the Reporter on Progress of Pharmacy | 44 20 |
| Semi-Centennial Index | 60 96 |
| Salaries | 2,800 00 |
| Premium on Treasurer's Bond | 12 50 |
| Traveling Expenses | 99 68 |
| Section on Education and Legislation | 1 74 |
| Section on Practical Pharmacy and Dispensing | 25 00 |
| Committee on Transportation | 5 03 |
| Committee on Membership | 21 13 |
| Committee on Semi-Centennial | 192 56 |
| Printing and Stationery | 438 10 |
| Insurance | 16 88 |
| Gold Badges and Bars | 65 00 |
| Enno Sander Prize | 50 00 |
| Ebert Prize | 28 00 |
| Miscellaneous Expenses | 273 46 |
| Amount paid for current expenses | $7,784 24 |
| Life Membership Fund | 90 00 |
| National Formulary | 154 65 |
| Total amount of disbursements | $8,028 89 |
| Cash on hand, July 1, 1903 | 3,832 03 |
| Total | $11,860 92 |

APPROPRIATIONS AND EXPENDITURES, UNDER SAME, FOR THE FISCAL YEAR, JULY 1, 1902, TO JULY 1, 1903.

| | Appropriations. | Expenditures. |
|---|---|---|
| Salaries | $2,800 00 | $2,800 00 |
| Proceedings | 3,500 00 | 3,500 00 |
| Miscellaneous Expenses | 280 00 | 273 46 |
| Printing and Stationery | 440 00 | 438 10 |
| General Prizes | 200 00 | |
| Traveling Expenses | 150 00 | 99 68 |
| Stenographer | 150 00 | 150 00 |
| Badges and Bars | 80 00 | 65 00 |
| Journals for Reporter on Progress of Pharmacy | 50 00 | 44 20 |
| Section on Scientific Papers | 30 00 | |
| Section on Education and Legislation | 30 00 | 1 74 |
| Section on Commercial Interests | 25 00 | |
| Section on Practical Pharmacy and Dispensing | 25 00 | 25 00 |
| Committee on Transportation | 30 00 | 5 03 |

| | | |
|---|---|---|
| Committee on Membership | $25 00 | $21 13 |
| Insurance | 20 00 | 16 88 |
| Premium on Treasurer's Bond | 12 50 | 12 50 |
| Compiling the Collective Index for Fifty Years | 300 00 | 60 96 |
| Committee on Semi-Centennial Celebration | 200 00 | 192 56 |
| Committee on Historical Pharmacy | 50 00 | |
| Unexpended Balance | | 691 26 |
| | $8,397 50 | $8,397 50 |

PROSPECTIVE ASSETS.

Not counting what is due from members whose names will probably be dropped from the roll at the annual meeting, and also from members whose residence is unknown, there was outstanding on the books of the Association July 1, 1903:

| | |
|---|---|
| Annual Dues for 1902 | $500 00 |
| Annual Dues for 1903 | 3,280 00 |
| | $3,780 00 |

Respectfully submitted, S. A. D. SHEPPARD, *Treasurer.*

Mr. Hancock moved to receive and adopt.

MR. EBERT: I would like to ask our Treasurer what our liabilities are. He says we have $3,000 in the treasury.

THE TREASURER: Yes, sir; in cash. We have no liabilities. Salaries are paid up to date, and every bill that has been presented has been paid. (Applause.) I would like to answer the thought that is behind that question. In former years it was our custom to have left at the end of the fiscal year the liability of one-half a year's salary of the officers, which would be $1,400, but that custom has been done away with. Formerly the officers were paid in January and July; our fiscal year is from July to July. That custom has been changed, and they are now paid in December and June, in order that the payment of salaries may come before the end of the fiscal year—and very properly, as they ought to come within the fiscal year of the Association, I think. That change was made two or three years ago. That, I think, is the real answer to Mr. Ebert's question. Everything has been paid up in full, and we have no liabilities. On the 1st day of July we did not owe a cent.

MR. KREMERS: If the dues for the present year had not been paid before July 1st, how much money would there have been in the treasury?

THE TREASURER: I cannot answer that question accurately without referring to the books, but I should say there have been collected $1,500 of dues on the year 1903.

MR. EBERT: Now, as I understand the situation, we have already collected money on this fiscal year which you have in your possession?

THE TREASURER: That is right.

MR. EBERT: We expect to draw now on that very money?

THE TREASURER: That comes in every year, so if you take it out on this year it comes in next year. You simply take it out of one hand and place it in the other. That is following the example of years.

MR. EBERT: The only question is this: When we find a balance in the treasury of three or four thousand dollars, we are liable to make expenses which we would not incur if we knew just exactly the amount of money we had to run on for the fiscal year.

THE TREASURER: I would like to call attention to one item in the report. The bonds called in during the year amounted to $2,000; they were called in, and that amount is in the treasury. A number of years ago we had a fund in the treasury that we didn't need at the time, and that was taken out and invested in bonds. One of these bonds was sold two or three years ago to pay off an indebtedness of $1,000 borrowed money, and the remaining two have been called in in the last fiscal year. If these two bonds had not been called in our cash balance would not have been so large, of course.

MR. KREMERS: Then if $2,000 had not been paid in advance and $1,500 collected from another source, we would have had a deficit on last year's business?

THE TREASURER: We would have come out even.

MR. EBERT: Gentlemen, for a number of years we have gone along just from hand to mouth. We have not got one cent ahead, and if it had not been for this $2,000 that we obtained from the calling-in of these bonds and the $1,500 that we have obtained from dues for this year, we would actually be behind. Now, I want to caution the Association against any unnecessary expenditures, because I have gone through times when we were actually bankrupt, and the only thing we could do was to put our hands into our own pockets as individuals and pay the debts of this Association, and it is not a pleasant thing to be in that position. That is why I caution you. I want to say that there has been a sentiment in this Association for a number of years, that it is bad policy to have the temptation before us to enlarge expenses because of a lot of ready money that happens to be in the treasury. Now we want to get some money ahead, and the only way is to live within our income; and we want to be very careful, and when we find our expenses going beyond our income we want to cut off expenses. I have had experience along this line, when the Association was in financial distress, and I know what it means.

MR. DOHME: Mr. President, I have had considerable experience with the Association's finances, having been for a number of years on the Finance Committee, where I had to consider this question of income and expenses, and I can say that it has always been the object of the Treasurer and the Finance Committee to make the income and outgo harmonious; and we have always had sufficient money, with rare exceptions, to do that. I would also remind you that there is considerable invested fund of the Association which can be fallen back on—that is, the income from it.

MR. LOWE: As a member of the Finance Committee—and as chairman of the Auditing Committee—I want to say, that we have tried to watch over the financial matters of the Association very closely. Last year's expenses of the Association were enormous, of course, because of necessary expenses connected with the Jubilee Meeting—very much larger than they probably will be again for a number of years. We have now between three and four thousand dollars in the treasury, which can be drawn on at any time, and in addition we have three special funds which, altogether, amount to between twenty and twenty-one thousand dollars.

A vote was then had on the motion to adopt the Treasurer's report, and it carried.

Mr. Wooten, as chairman of the Section on Commercial Interests, said he had some resolutions from that Section that he would like to present at this time for the action of the Association in general session, if in order. The chair held the gentleman to be in order, and Mr. Wooten read the following as the first recommendation from the Section:

*Resolved*, That the Commercial Section recommends to the Association the adoption of the following resolutions:

*Resolved*, That it is the sense of the Association that retail pharmacists will advance their individual interests and the interests of pharmacy as a whole by making the working hours of clerks as few as possible consistent with the proper conduct of their respective stores, also by providing clerks with healthful sleeping-quarters and by liberality in the matter of compensation, the end sought being to bring into the profession of pharmacy a greater number of capable and ambitious young men who will otherwise be deterred from entering it.

On motion of Mr. Hallberg, the resolution just read was adopted.

Mr. Wooten then read the second resolution coming from the Commercial Section:

*Resolved*, That it is the sense of the Association that the several schools of pharmacy ought to include in their curricula a course of commercial training comprehensive enough to insure that the student is fully capable of properly managing a retail drug business, the passing of a satisfactory examination in this branch being prerequisite to graduation.

On motion of Mr. Cliffe, seconded by Mr. Meissner, the resolution as reported was adopted.

Mr. Wooten read the third resolution:

*Resolved*, That it is the sense of the Association that retail pharmacists will greatly increase their prospects of success as business and professional men by inaugurating occasional conferences between their respective local organizations (of which there ought to be one in every community) and the physicians of their localities, in which conferences there are brought up for discussion the relations of the physician and the pharmacist to each other and of both to the public, it being confidently believed that such conferences will benefit all concerned.

On motion of Mr. Howard, seconded by Mr. Wibert, the resolution as read was adopted.

Mr. Wooten read the fourth resolution:

*Resolved*, That it is the sense of the Association that price-cutting on proprietaries and other goods inaugurated and carried on for the specific purpose of gaining an advantage over one's fellow pharmacists is wrong in principle and subversive of the Association spirit, to foster which spirit the organization was formed.

On motion of Mr. McIntyre, duly seconded, the resolution was adopted as read.

The fifth resolution was reported by Mr. Wooten:

*Resolved*, That this organization deprecates the feeling said to exist in some quarters that the American Pharmaceutical Association is not in as hearty accord as it should be with the efforts which the retail pharmacists of the country are putting forth individually and collectively to improve their financial status.

*Resolved*, That the Association heartily commends all such endeavors and cordially urges upon pharmacists the desirability of identifying themselves closely with their respective local and state associations, with the National Association of Retail Druggists, and with the American Pharmaceutical Association, the commercial section of which devotes itself exclusively to subjects of especial interest to those engaged in conducting retail drug stores.

On motion of Mr. Mason, seconded by Mr. Fennell, this resolution was also adopted.

The President stated that the report of the Committee on Status of Pharmacists in the Government Service, which the Association did not have an opportunity to consider at the second general session, was now in order, and as he was chairman of that committee he would ask Vice-President Cliffe to take the chair while he read the report, which he did. The following is the full text of the report:

## REPORT OF THE COMMITTEE ON THE ADVANCEMENT OF THE STATUS OF PHARMACISTS IN THE SERVICE OF THE UNITED STATES GOVERNMENT.

During the year we have made an effort to secure commissions for the pharmacists of the United States Navy. While our bill was favorably reported by the Surgeon General of the United States Navy, for various reasons we did not succeed in securing its passage at the last session of Congress. In a recent correspondence the President of our Association, who is also our chairman, invited Dr. P. M. Rixey, Surgeon General of the United States Navy, to attend our present meeting and also to detail two pharmacists to attend as delegates. Dr. Rixey cannot be present with us, but has sent a delegate to represent the service. This is the *first recognition of this kind* which pharmacists have ever secured from the United States Navy Department, and is the evident forerunner of more and more cordial relations between pharmacists of the United States and the splendid navy of which they are so proud.

Dr. H. W. Wiley, Chief Chemist of the Department of Agriculture, has notified us that he has detailed a delegate of one to represent the United States Department of Agriculture at our present meeting. Dr. Wiley also wrote that he would be prevented from attending himself, as he would be absent from the United States at that time. The delegate selected is Mr. Lyman Kebler, the very able pharmaceutical chemist, who is one of our much esteemed members. *This is the first recognition of this kind* which pharmacists have ever secured from the Department of Agriculture. That one of our members should be made Chief Chemist for the work of the National Bureau of Control of Medicines and Foods is along the lines on which so much of our work has been done, and which is, that the pharmacist is something more than a counter of pills and tablets, and measurer of liquids, and our United States Government should give him the proper recognition and status which he deserves.

In marked contrast with the action of the Department of Agriculture is that of the Department of the United States Army. In reply to a letter from our chairman requesting that the Surgeon-General of the U. S. Army attend our meeting and that two pharmacists be detailed to be present as delegates from the pharmacists of the U. S. Army, the following is a part of the reply returned:

"The position of pharmacist or apothecary does not exist in the Army. Among our Sergeants 1st class and the Sergeants of the Hospital Corps, there are some graduates of pharmacy and many others competent to fill prescriptions. Except at one or two stations, and those of the largest hospitals, the pharmaceutical work of the non-commissioned officers is but a part of their duties, in many cases a comparatively small part. Analytical Chemistry and making crude drugs into their different recognized preparations are not required of these men. It follows then that the Sergeant must be first a soldier, able to manage and instruct men, and that one of his secondary duties (except in the rarest instances), is to dispense the ready-prepared tablets or compound the simple medicines required.

"(Signed) R. W. O'REILLY,
*Surgeon-General, U. S. A.*"

It would seem from this letter that the elaborate and difficult examination, shown in our report last year, which is required of the Sergeants of the Army Hospital Corps, is

largely a needless affair, and that the men who do the pharmaceutical work of the Army are primarily soldiers and secondarily counters of tablets. There appear to be some graduates in pharmacy in the service and some rare instances where there is something more than counters of tablets utilized. These facts, united with the examinations required, would indicate that the services of a few competent pharmacists are utilized in the army. Such men who are in the service should be given the title of pharmacist and a proper salary. The Army certainly needs good pharmacists, as well as good physicians. In modern times the best physicians find the pharmacists their most valuable allies. It is true that many depend upon the ready-made prescriptions of the manufacturing pharmacists, but there are many capable ones who get up their own combinations, taking advantage of the chemical and physical knowledge of drugs of some well-posted pharmacist. These latter are the originators of many good combinations, which the manufacturing pharmacists quickly take up and push among those physicians who are willing or compelled to confine the treatment of the patients to ready-made tablets and liquids, and to make the disease fit the remedy, rather than the remedy fit the ailment and the patient.

Our chairman also invited Dr. Walter Wyman, Surgeon-General of the Public Health and Marine Hospital Service of the Treasury Department of the United States, to be with us at our present meeting and to detail two pharmacists to be with us as delegates from that service. While regretting that he cannot be present himself, Dr. Wyman promised to detail two pharmacists as delegates. This was done at our invitation last year for the first time, and was the first official recognition of this kind which we have ever received. During the present meeting we have delegates from *three departments* of the United States Government.

As a result of the careful consideration of the claims and statements of our committee last year, the Public Health and Marine Hospital Service gave the title of pharmacist to the Hospital Stewards of that service, dividing them into three classes. It also increased the salaries of the different grades. That of the first class was made large enough to secure the service of first class men.

The salaries of the new pharmacists are now as follows:

| | Per Year. | |
|---|---|---|
| Senior Pharmacist, on duty New York Purveying Depot | $1,800 | With 10 per cent. additional for each 5 years of service, not to exceed 40 per cent. This additional compensation to be in lieu of commutation and other allowances. |
| Senior Pharmacist, on duty Ellis Island Immigrant Station | 1,800 | |
| Junior Pharmacist, on duty New York Purveying Depot | 1,500 | |

| | Per Year. | |
|---|---|---|
| Pharmacists, 1st Class | $1,000 | With 10 per cent. additional for each 5 years of service, not to exceed 40 per cent., and $25 per month commutation for quarters, fuel and light, and $10 for subsistence. On foreign duty, $50 commutation per month will be allowed. |
| Pharmacists, 2d Class | 800 | |
| Pharmacists, 3d Class | 700 | |

In a simplified form these salaries are as follows:

| | 1st 5 years. | After 5 years. | After 10 years. | After 15 years. | After 20 years. |
|---|---|---|---|---|---|
| Senior Pharmacist, on duty New York Purveying Depot | $1,800 | $1,980 | $2,160 | $2,340 | $2,520 |
| Senior Pharmacist, on duty Ellis Island Immigrant Station | 1,800 | 1,980 | 2,160 | 2,340 | 2,520 |
| Junior Pharmacist, on duty New York Purveying Depot | 1,500 | 1,650 | 1,800 | 1,950 | 2,100 |
| Pharmacist, 1st Class, $1,000 salary, $300 commutation, $120 subsistence | 1,420 | 1,520 | 1,620 | 1,720 | 1,820 |
| Pharmacist, 2d Class, $800 salary, $300 commutation, $120 subsistence | 1,220 | 1,300 | 1,380 | 1,460 | 1,540 |
| Pharmacist, 3d Class, $700 salary, $300 commutation, $120 subsistence | 1,120 | 1,190 | 1,260 | 1,330 | 1,400 |

To these salaries should be added $300 more per year when on foreign service.

This is a range of from $1,120 per year to $2,520 when on duty in the United States. On foreign duty the range is from $1,420 to $2,820 per annum. There is also a pharmacologist who gets a straight salary of $3,000 per annum.

Pharmacists throughout the country are much pleased at this proper recognition of pharmacy, and note with satisfaction the fact that Surgeon-General Walter Wyman is giving the service the advantages of first-class pharmacists. In his splendid warfare against disease and epidemics he is realizing the great value of well trained pharmacists and pharmaceutical chemists, and is causing the service to become more attractive to American pharmacists. This is in sympathy with our American ideals, and we wish him Godspeed in the good work.

Among the membership of our American Pharmaceutical Association are a number who are in the public service. The dues of these members bring to the Association a neat little sum each year. Our Association must feel much gratified that its work in advancing the status of pharmacists in the public service has also added very materially to our membership for several years past.

Our report for this year is not long, but it shows some very excellent results for the splendid and harmonious efforts of the Association, to which the pharmacists of the whole of the United States have rallied in a most effective manner.

Respectfully submitted, GEORGE F. PAYNE, *Chairman.*

Mr. Bethea, of Mississippi, moved that the report be received, and Mr. Voss, of Ohio, seconded the motion. Carried.

MR. BETHEA: Mr President, the results attained by our Committee on the Status of Pharmacists in the United States Government Service cannot but be very gratifying to all of us, and as a gauge of our appreciation of the excellent work of this committee, and looking along the line as far as we can, I would like to submit the following brief resolutions:

*Resolved*, That the American Pharmaceutical Association extend their hearty thanks to their Committee on the Advancement of the Status of Pharmacists in the United States Government Service, for their continued successful work.

*Resolved*, That the American Pharmaceutical Association express to Surgeon-General P. M. Rixey, U. S. N., Surgeon-General Walter Wyman, P. H. and M. H. S., and Chief Chemist Harvey W. Wiley, of the Department of Agriculture, the pleasure given by the detail of delegates to represent their respective departments, and offer its congratulations upon the selection of such excellent representatives.

*Resolved*, That the Association express to Surgeon-General P. M. Rixey its warm appreciation of his cordial regard for the American Pharmaceutical Association and his realization of the value of pharmacists to the United States Navy. Furthermore, that the Association request Surgeon-General Rixey to use his best efforts to secure all the rights of warrant officers, including commissions in the grade as chief warrant officer, for the pharmacists of the United States navy and an increase of twenty-five in their number.

*Resolved*, That the Association request Surgeon-General Walter Wyman, P. H. and M. H. S., to use his best efforts to secure warrants for the pharmacists of his service.

*Resolved*, That the Association request Surgeon-General R. W. O'Reilly, U. S. A., to use his best efforts to secure a grade of pharmacist in the United States army, with the rank of Second Lieutenant, but ranking after Assistant Surgeons of the same grade.

*Resolved*, That the Association pledge a continuation of its hearty support and coöperation in all efforts to secure an improvement in the status of pharmacists in the United States government service, especially in the more urgent measures here set forth.

*Resolved*, That the Secretary be instructed to send a copy of these resolutions to each of the above named gentlemen.

THE CHAIR: Gentlemen, the resolutions as read are before you. What is your pleasure?

MR. GORDON: Mr. President, if I may be permitted, I would like to say a few words

in this connection. In the first place, I think the hearty thanks of the Association are due to Surgeon-General Rixey, of the Navy, and also to Assistant Surgeon-General John M. Uri, who is a personal friend of mine, and who entered the Naval Service as an apothecary, and who, now that he is Assistant Surgeon-General, has done a great deal to help us. Dr. Rixey is heartily in favor of two objects, as stated in these resolutions: that is, securing for the pharmacists in the Navy the same status as all other warrant officers have, and also securing an increase in the corps of pharmacists in the service. He told me to state to the Association that the reason why the Bureau could not work more strenuously for these measures now was because they had something more important on hand; that there was great need of additional surgeons for his medical force, and in his eyes it was more important to secure a larger number of surgeons first, and then he would take up pharmacy matters. It is the intention of the Bureau to take up a bill embodying these features this year and push it through Congress if possible. Our warrants are now signed by the Secretary of the Navy instead of by the President, and can be revoked at his pleasure. Of course provision is made for gross misconduct or something like that, but there is a possibility that a pharmacist might have a disagreement with a medical officer, for instance, and he might have it in his power to have the pharmacist's warrant revoked. It is not very likely that such a thing will happen, but it may be done. Then again, there is a bill pending to promote warrant officers after six years' service. If we want to get the benefit of a measure of that kind we must have special legislation. It has been decided by the Judge Advocate General of the Navy that everything we get must be obtained by special act of Congress, therefore on account of this undesirable position in which we find ourselves we are endeavoring to secure legislation that will put us on the same footing as other warrant officers, and then whatever they get we will get.

Mr. Good moved to adopt the resolutions as read, which being duly seconded, the chair put the vote on the motion to so adopt and it carried.

President Payne resumed the chair.

The Secretary read the following proposed amendments to the By-Laws, which had been previously read at the second general session and laid over, under the rule, explaining again that the proposed changes involved only a transposition of time as to the work of the two Sections referred to.

PROPOSED AMENDMENTS TO BY-LAWS OF THE A. PH. A.

Article VI of Chapter VIII shall be amended to read as follows:

"At the fourth and fifth sessions the Section on Pharmaceutical Education and Legislation shall consider the business assigned to that Section."

Article VIII of Chapter VIII shall be amended to read as follows:

"The eighth and ninth sessions shall be devoted to the subject of Practical Pharmacy and Dispensing."

These changes were proposed by Mr. J. W. T. Knox, as chairman of the Section on Education and Legislation. Mr. Mayo, seconded by Mr. Dohme, moved to adopt the proposed amendments to the By-Laws as read, and the motion was so put and carried.

The Secretary reported a receipt of a cablegram from Honolulu, signed "Rumsey," sending greetings to the Association, to which, on motion of Mr. Ebert, the Secretary was directed to make suitable reply by mail.

The Secretary also reported the receipt of a telegram from the Citizens' Business League, of Milwaukee, inviting the Association to meet in that city next year, which took the same course. The telegram was received too late for consideration by the Committee on Time and Place.

Mr. Hallberg proposed the following resolution:

*Resolved*, That the Council in formulating the program for the annual meetings endeavor to concentrate the sessions so that the time consumed for the meeting shall be limited to the least number of days.

Mr. Eliel seconded the resolution and it was adopted.

The Secretary called attention to the copies of Epitome of the National Formulary distributed by Mr. Hallberg, and reminded the members that for the past two or three years they had been on sale at the office of the General Secretary.

The Secretary read the following communication from Mr. John F. Hancock, of Baltimore, which had been deferred at the second general session for lack of time to consider it:

## THE WILLIAM PROCTER MEMORIAL FUND.

BY JOHN F. HANCOCK, BALTIMORE, MD.

At the last meeting of the American Pharmaceutical Association—the Golden Jubilee—the Committee on the Procter Memorial presented a report, with recommendations, which was adopted. That action stands recorded.

We do not object to the report so far as it affects the Association as an individual, but we do claim that more should be done by the pharmacists of this great country, many of whom are not members of the American Pharmaceutical Association, to honor and perpetuate the name and fame of "The Father of American Pharmacy."

We do not believe that the American Pharmaceutical Association should be alone in the effort to substantially recognize the importance of one who, above all others, has benefited humanity through the uplifting of our craft. The example of his character is eternal, and to celebrate it by an ephemeral emblem would not dignify his modest worth.

Neither do we agree with those who are influenced against the monument because of the commendable modesty of members of his family who feel that a monument would be too ostentatious. We are enjoined not to "hide our light under a bushel," and would take this occasion to remind you that monuments are not usually erected by the immediate family of a noted person, but by the loyal appreciation of admiring friends and co-laborers; and the erection of a monument to memorialize the life of a benefactor of a race or a craft is the writing of history in its most indestructible manner. What would we know of that great nation of antiquity, the Egyptians, were it not for history thus inscribed?

It has also been objected that a monument to Wm. Procter at the national capital would be inappropriate, since the monuments there erected have been to statesmen and the heroes of war. The memory of others quite as distinguished have been honored at the capital; and our claim for the Smithsonian grounds, as the most suitable site for the Procter Monument is because these grounds are dedicated to science, and admirably suited to memorialize an active and useful life so closely connected with the development of a profession. On stone and metal is being written the epitomized history of our country, from the lives of many of her great and good citizens; and the scientific world is becoming more generally represented at the City of Washington through its

institutions and the pilgrimages of her votaries, and to these the Smithsonian grounds and buildings are of special interest.

Pharmacists should feel enough pride in their profession to desire public recognition, especially when they have such an honorable subject to represent them, and the term pharmacist here employed should include all, who by business relations are identified with the higher aims of pharmacy.

The American Journal of Pharmacy and the Annual Proceedings of the American Pharmaceutical Association bear testimony to the valuable life work of the late William Procter; and his integrity and genial nature were known by the many members of the American Pharmaceutical Association in the days when he was an active member; and it is our wish to have the American Pharmaceutical Association appoint the committee on "The William Procter Monument Fund."

This committee (three or five) should be empowered to solicit individual subscriptions, from members of the Association, under such rules and regulations as may be adopted. Subscriptions should be turned over to a responsible person, under bond, subject to the order of the Association. The Association should request the co-operation of the various State Pharmaceutical Associations; and each State Association should be requested to solicit individual subscriptions from all of their members who have not subscribed as members of the American Pharmaceutical Association; and individual pharmacists, chemists and druggists who are not members of any Association, should also be given the opportunity to subscribe. All collections made by the State Associations should be turned over to the appointed agent of the American Pharmaceutical Association, for the William Procter Monument Fund; and all collections from non-Association persons should also be turned over to the same appointed officer or agent.

We would also recommend that the American Pharmaceutical Association give to each subscriber of a sum not less than $— a Procter badge as receipt for such subscription. By this means we believe that there would be aroused a large individual interest, and the badge would be prized as a memento of the monument. We think that this method would make friends and members for this Association, which Procter himself so zealously assisted in founding, and for whose success he gave his untiring efforts to the time of his death.

The aim should be to collect not less than twenty thousand dollars ($20,000.00), and we are confident that well-directed efforts would easily secure that amount. In a similar case the U. S. Government appropriated the space in the Smithsonian grounds and one thousand five hundred dollars ($1,500.00) for the granite base on which was erected, by private subscription, a bronze statue.

A monument to memorialize William Procter would be a chapter in the history of our country, and when erected the U. S. Government would become its custodian. It would tell to future generations that the nineteenth century had produced a man who had eminently honored the profession and had been unanimously acclaimed the "Father of American Pharmacy."

The Maryland Pharmaceutical Association at its last annual meeting was placed on record by adopting the following:

*Resolved*, That the Maryland Pharmaceutical Association favors the erection of a monument in the Smithsonian Grounds, at Washington, D. C., to memorialize the life work of the late Professor William Procter, under such rules and regulations as may hereafter be adopted.

Should the American Pharmaceutical Association favor the monument, a committee should be appointed, at this or the next annual meeting, to formulate a plan of procedure. It may take several years to consummate the work; indeed, there is no need of undue haste, but the time has arrived when action should be taken.

Mr. Dohme moved that the communication be received and printed in the Proceedings, and that it be referred to the Council for consideration and report at the next annual meeting, which motion was seconded by Mr. Ebert and carried.

MR. WHELPLEY: Mr. President, I find that the adoption of the minutes of the Council carries with it the adoption of certain changes in the By-laws, and it is customary for the Secretary of the Council to read these changes and for the Association to take a special vote upon them. The first is Article 2, Chapter 8, of the By-laws, which should be changed to read as follows:

Every application for membership shall receive the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of three-fourths of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-laws and paying the annual dues for the current year. Any application for membership made prior to March 1st shall be considered as of the current fiscal year.

Also amend Section 5 of Article 13, Chapter 8 of the By-laws, by striking out all after the word "shall," and inserting in place thereof the following: "report at the annual meeting the names of all newly-elected members."

Amend Article 4, Chapter 8, by striking out the words "act on the report of Council on membership."

A motion to approve these changes would be in order.

Mr. Diehl, seconded by Mr. Ebert, moved to adopt these changes in the By-laws as reported, and the motion was put and carried.

MR. KREMERS: I have a matter which can be disposed of quite readily, I think. We all know the painstaking care with which our Treasurer conducts the business of his office, and I want to say that whenever I have talked Association finances with the Treasurer he has indicated great willingness to tell me anything he knew about any point on which I wanted to be advised. Now he has from year to year made a general report to the Association. We need something more, though, than the statement that he makes, and I want to ask him to present such a report as will enable the members to better analyze the report when read. Therefore, I offer the following:

Moved by Edward Kremers and seconded by A. E. Ebert, that inasmuch as it is impossible for the members of this Association to analyze the careful report of our Treasurer, be be requested hereafter to add to his customary report such explanatory statements as will not only show whether a cash balance exists or not, but which will present clearly the fact whether or not the Association's business has been conducted with a profit or a loss during the fiscal year covered by the report.

Mr. Bartells, seconded by Mr. Ebert, moved to adopt, and the motion prevailed.

The Secretary presented the following communications, which, on motion, were referred to the Publication Committee.

## REPORT OF DELEGATE TO THE NEW JERSEY PHARMACEUTICAL ASSOCIATION.

*To the President and Members of the American Pharmaceutical Association:*

As your delegate, I attended the thirty-third annual meeting of the New Jersey Pharmaceutical Association held at the West End Hotel, Asbury Park, N. J., June 10th and 11th, 1903.

The meeting was well attended and very interesting. The President, H. J. Lohmann,

in his address, spoke of the need of higher education qualifications for young men intending to enter pharmacy; also of the increasing sale and use of narcotics, and recommended that the Association take some action to discourage the sale of them. A resolution to that effect was adopted.

The report of the Secretary of the Board of Pharmacy was very interesting, showing the work accomplished during the year. The board brought suit in 14 cases and fines were paid without contest. They have succeeded in stopping the sale of drugs and medicines in grocery stores and some large department stores, or forcing them to have registered pharmacists in charge of that department. The report showed 357 were examined by the board and 90 passed; total number of registered pharmacists in the state, 1,826.

A number of interesting papers were presented by the Query Committee, and some were read, while others were sent to the Publication Committee and read by title only.

Two important resolutions were adopted, the first was on synthetics.

Be it resolved by the New Jersey Pharmaceutical Association in annual session assembled that,

WHEREAS, The extensive medical use of patented synthetic chemicals may require their recognition by the U. S. P., we would urge that all trade-marked names be excluded from our national standard.

*Resolved*, That we strongly recommend that the introduction of all such products be under their true chemical names wherever practicable, and where this is not advisable, that names be coined for the official titles.

The second was a resolution to petition Congress to modify the patent laws in such a manner as to exclude and forbid all product patents on medicinal substances. Copies to be sent to the U. S. Senators and congressional representatives from New Jersey.

Respectfully submitted, G. W. PARISEN.

*August 4, 1903.*

BALTIMORE, *July 30th, 1903.*

*To the President and Members of the American Pharmaceutical Association.*

*Gentlemen:* At the 21st annual meeting of the Maryland Pharmaceutical Association, held at Ocean City, July 14–17, 1903, the following resolution was unanimously adopted:

*Resolved*, That the Maryland Pharmaceutical Association favors the erection of a bronze statue of William Procter, Jr., "The Father of American Pharmacy," in the Smithsonian grounds at Washington, D. C., as the most fitting testimonial of that illustrious pharmacist, under such rules and regulations as may be necessary.

As Secretary of said Association I was instructed to forward this resolution to you, with the request that you take action in this matter, and endeavor by solicitation from sister Associations, as also individuals, to create a fund with this object in view.

Assuring you that the Maryland Pharmaceutical Association is prepared and willing to follow its resolution by a liberal contribution for the cause,

I remain very respectfully, LOUIS SCHULZE, *Secretary.*

The Chair announced that the next order of business would be the installation of officers.

MR. CLIFFE: Mr. President, I would like to move that the thanks of this Association be extended to our local Secretary, Mr. F. W. R. Perry, for the admirable way in which he has conducted the duties of his office, and I wish to say in this connection that I think he has been placed at an exceeding disadvantage. This is a place far removed from the population centers, and with the meager facilities at his command I think he has done exceedingly well.

Mr. Wilbert seconded the motion, and it was carried with applause.

MR. WHELPLEY: I feel it is due the local Secretary to make a little explanation about our entertainment. This Association has for many years gone on the plan of paying its own way. I believe, however, that this is the first time in the history of the Association, since the entertainment-ticket feature was adopted, that the Association has absolutely done so. At this meeting all of the entertainment expense has been met by the money received from your entertainment tickets. (Applause.)

THE PRESIDENT: Gentlemen, before beginning the installation of officers I want to express my intense gratification and appreciation of the hearty manner in which every one of you have responded to the appeals I have made during the past year as far as lay in your power. Our meeting place being so far away from the large centers of business, I naturally expected a much smaller attendance than we have had. The railroad and boat connections are not all that could be desired, and it is very gratifying to see so many here under the circumstances. I see members before me who spent several days on the road in coming to the meeting. I also want to commend the active interest indicated by our members here in the proceedings. After last year I felt as though the whole country had been combed with a fine-tooth comb, and there was nothing left for the new President to do, but I found it otherwise. Gentlemen, I have been spoken of as being a *Payne*-ful member, and as a man who might give you some *Payne*-ful experiences and recollections. Of course my name is subject to a good many puns, but I hope that your recollections of my administration will not be altogether painful, but that some of them may be pleasant. Now we have dwelt together here very fraternally, indeed, and before the installation of new officers takes place I simply want to express my very, very hearty and warm thanks, and to say that I feel closer and dearer to every member of this Association than ever before. It may be expressing my warm Southern blood too much, but I feel more like putting my arms around you crowd of men than I ever did before.

The chair then nominated Mr. Bartells and Mr. Anderson as a committee of two to escort the newly-elected President to the stage. These gentlemen performed that pleasant office, and brought Mr. Hopp forward amid the applause of the audience.

THE PRESIDENT: Ladies and Gentlemen, let me introduce to you your new President, Mr. Lewis C. Hopp, of Cleveland. [Applause.]

Mr. Hopp then said:

*Ladies and Gentlemen:* I thank you heartily for the high honor you have conferred upon me by electing me as your presiding officer for the ensuing year, the highest position of honor in the gift of the Association—an honor I hold to be the greatest of any in American Pharmacy.

With your kind indulgence and assistance, as your pilot I hope to steer this great ship, the American Pharmaceutical Association, safely and wisely for the ensuing year, so that when we come together in 1904 at Kansas City I can turn over the affairs of my official position to my successor with credit to the Association and to myself.

To the scrappy members I ask them to have a kindly consideration for me as I am a *novice*, yet if they will scrap I may be forced to do likewise.

This meeting now coming to a close has been a most successful one taken from all sides. Attendance, considering the distance, was very good. The various sections were well attended and valuable additions made to Pharmaceutical History.

We have had at this meeting problems presented to our Association which mean much to pharmacy and the American Pharmaceutical Association. These are now in

the hands of ably constituted committees, so that when we meet in 1904 these same problems will be laid before you in a clear and concise manner.

Our membership has received a handsome addition this year. Keep up the good work, and when you come to Kansas City in 1904 do not fail to hand in an application for a new member. Again I thank you.

Mr. Hopp's remarks were greeted with hearty applause.

Mr. Payne, the retiring President, suiting the action to the word, then said:

Mr. Hopp, I now place upon you the insignia of your office as President of the American Pharmaceutical Association (pinning the gold badge of the President to the lapel of his coat), and turn over to you the gavel used by a number of your predecessors. When the Association last year, following the precedent of fifty years, named a new man for President, they took one *Payne*-ful step. Now they will take one great, long *Hopp!* [Applause]—a splendid executive officer: and I am sure he will make our next meeting a most memorable one. Mr. Hopp, I resign in your favor.

Mr. Hopp took the chair.

At request of the chair, the committee escorted Mr. Alpers to the stand, and the President said:

*Fellow Members of the American Pharmaceutical Association,* I am pleased to introduce as our First Vice-President Mr. William C. Alpers, of New York. [Applause.]

Mr. Alpers said:

*Mr. Chairman, and Ladies and Gentlemen:* I have always heard that the first and only duty of the First Vice-President is to be ornamental and keep still. I am reminded of the first time I attended one of our annual meetings, when the Association met in the White Mountains. During that meeting I had occasion to make some remarks in the Commercial Section, and afterwards in the Educational Section. I believe a little stir was created at that time. At the end of the session I took a boat-ride on Profile Lake, with the companion of my joys and woes, and one of the peculiar characteristics of this lake is, that a whisper uttered on one part of the lake can be distinctly heard in another part. We passed some gentlemen in a boat, and I bowed to one of them I knew. When they supposed they were out of hearing, one of them said to the other, "Who is that man in the boat?" "Oh, don't you know him? that is that new man from New York." "Oh, is he the one that made all the racket?" "Yes; he is the one." "Why don't they stop him?" said number one. "They can't," said number two. "Well, they ought to make him Vice-President—then he will keep still!" [Laughter and applause.] Now, gentlemen, you have made me Vice-President, and what will be the result? At that time I had no idea what the American Pharmaceutical Association was. I knew no one there, and came to find rest: but I found a great deal more. I had hardly been a day among you when I discovered there was more in pharmacy than the daily drudgery I had been educated to. I found that I had a great deal to learn, and I determined to learn it. I discovered that the scope of pharmacy goes far beyond the walls of the little retail store. It may be that in the heat of debate I have not always met with the approval of those who were older and better posted than I was, but I believe even then, when to an outsider we would seem to be enemies, seemed to be abusers of each other, there were bonds of friendship created, such ties formed, as would not have existed otherwise, and that we learned to respect and love each other all the more

for the heat of debate. It has been that way with me, and I think it has with others. Gentlemen, if in my humble efforts to build up and develop the cause of pharmacy I have met with your approval, and if you have made me Vice-President in this sense, I thank you from a grateful heart, and whatever duty may be put upon me in the coming year I shall try to perform in a way not to disappoint you. [Applause.]

At request of the Chair, the committee brought the new Second Vice-President to the rostrum, and President Hopp introduced him by saying:

*Ladies and Gentlemen:* I am pleased to introduce Mr. A. M. Roehrig, of the Public Health and Marine Hospital Service, as your Second Vice-President. [Applause.]

Mr. Roehrig said:

*Mr. President and Members of the Association:* If the words of the First Vice-President, Mr. Alpers, appealed to you, then, as I am second violinist in this affair, I shall endeavor to have less to say, as I know you are all anxious to get away, and I will not detain you but a moment. I thank you, one and all, for the great honor conferred upon me. I assure you it was totally unexpected, and now that it has come I feel that it is not due to any popularity of mine, but rather to the service I represent, and I am pleased and feel greatly honored that I should be the medium through which the Public Health and Marine Hospital Service should be thus honored by the Association. Gentlemen, I thank you. [Applause.]

The Chair announced that the Third Vice-President, Mr. Otto F. Claus, of St. Louis, was not present and could not be installed.

The Chair asked the committee to escort the "working team" of the Association to the platform—the General Secretary and the Treasurer. The committee brought Mr. Caspari and Mr. Sheppard to the front, and the President said:

*Ladies and Gentlemen:* These two faithful officers, now on exhibition, are the working members of the Association. I think you will see from their appearance that you do not overwork them, and that they appear to be good for many and many a year yet. I take extreme pleasure in introducing Mr. Sheppard and Mr. Caspari, gentlemen. [Applause.]

Mr. Caspari, speaking for Mr. Sheppard and himself, said:

*Mr. President and Gentlemen:* I only want to say a word on behalf of Mr. Sheppard and myself. It has been ten years now since we were put on exhibition at Asheville, at the time when I was elected Secretary, and I remember it was remarked by somebody then that the American Pharmaceutical Association had selected two men for office who would hardly make one good man in size. We are still in the same condition we were ten years ago. Permit me to add that we appreciate deeply the confidence you have shown in our work and the satisfaction you have displayed in our efforts to serve you. [Applause.]

The Chair called on the committee to escort Mr. C. Lewis Diehl, the Reporter on the Progress of Pharmacy, to the rostrum, and when he came forward the President said:

*Fellow Members of the American Pharmaceutical Association:* I take pleasure in introducing to you Prof. C. Lewis Diehl, your Reporter on the Progress of Pharmacy. [Great applause.]

MR. DIEHL: *Mr. President, Ladies and Gentlemen:* The utterances that come from the Reporter on the Progress of Pharmacy are chiefly to be found in his report. I have on several occasions had the honor of addressing you from the stage, and my remarks have generally been very brief. I can only follow the lines previously adopted, and will say that I shall endeavor to give such satisfaction as I may have given heretofore in the performance of my duties. I thank you. [Applause.]

Mr. E. G. Eberle, of Texas, one of the newly-elected members of the Council, was not present, but Mr. Geo. F. Payne and Mr. Leo Eliel were, and the committee escorted them to the stage, at request of the Chair. The President introduced the gentlemen to the Association. Mr. Payne said he had already spoken once at this session, and yielded to Mr. Eliel, who said:

*Ladies and Gentlemen, and Members of the American Pharmaceutical Association:* It is getting quite late, and the only speech I can make to you is, I thank you. Let us get through with this and meet at dinner as quick as we can. [Applause.]

Mr. W. H. Burke moved that the Association return a hearty vote of thanks to the hotel management for the splendid hospitality extended at this meeting. The motion was seconded by Mr. Good and adopted.

On motion of Mr. Good, seconded by Mr. Dohme, the Fifty-first Annual Meeting of the American Pharmaceutical Association then stood adjourned *sine die*.

CHAS. CASPARI, JR., *General Secretary.*

# MINUTES

OF THE

# SECTION ON COMMERCIAL INTERESTS.

FIRST (AND ONLY) SESSION—TUESDAY AFTERNOON, AUGUST 4, 1903.

The Section was called to order at 3:30 p. m. by Chairman Wooten in the Casino of the Grand Hotel.

The Chairman asked Mr. Anderson, Secretary of the Section, to preside while he read the Chairman's Address, which he did as follows:

*Fellow Members of the Association:*

The axiom put forth by the great Galilean teacher "men do not gather grapes of thorns nor figs of thistles," may well serve as the basis of any paper written for the purpose of pointing out the best way (as determined by reason and experience) to advance the welfare of the buying-and-selling branch of pharmacy. The tendency to dwell overmuch upon the present not altogether satisfactory status and to anticipate a continuance, for an indefinite period, of conditions as bad as those which now exist, if not worse, has become quite general in the last few years and is much to be regretted. It is not only right, it is extremely desirable, that facts be looked squarely in the face at all times, otherwise we shall make little, if any, progress; the more repugnant the facts the greater the need for keen scrutiny. But to say dejectedly, as many have said, "I don't see any future for commercial pharmacy," is to render more difficult a problem hard enough at best by dampening the enthusiasm of those who are willing to give their best thought to its solution. Let us not, then, shake our heads ominously and lament that the times are out of joint; on the contrary let us determine to view the conditions in true perspective and, having laid the best plans we can devise for their betterment, let us give ourselves vigorously to the execution of these plans, assured that wisdom born of experience and of earnest endeavor will secure for us such rewards as are justly ours.

The scarcity of competent clerks, which lack seems to exist in nearly all parts of the country, in many cases proving a serious drawback, prompts the observation that the general prosperity now existing has created a demand for capable young men in all the various mercantile and manufacturing pursuits, especially in manufacturing pharmacy, and many clerks have left our ranks temporarily, if not permanently, to become salesmen or to accept other positions with those houses. By reason of the better compensation and greater personal freedom which characterizes these positions, it is likely many of the young men thus employed will not return to retail pharmacy. The disparity between the small number of available clerks and the rather large number of graduates

turned out yearly by the various pharmacy schools, forces the conclusion that a considerable percentage of these young men either do not enter pharmacy or if so that they do not long continue in it. Doubtless the reason for this has been suggested already, namely, that they are better paid and have fewer working hours in other vocations. Of course a large number cease to be available as clerks because of going into the practice of medicine or of opening stores on their own behalf.

This brings us to consider what may properly be regarded the greatest hindrance to the success of retail pharmacy that now exists, namely, the excessive number of stores. The population of the United States in 1900 was 76,215,129, that year there were, according to the Era Druggists' Directory, approximately 38,730 drug stores, or one store to every 1,967 of population. This does not include the thousands of small general stores and the hundreds of department stores, as well as mail-order houses, throughout the country, that handle medicines. When you consider the excellent sanitary conditions in nearly all sections and the rapid growth of education on the subject of preventing sickness, as well as the increasing number of Homeopaths, Osteopaths, Christian Scientists, Mental Healers, and others whose patronage is worth very little to a drug store, and when you still further reduce the number of patrons by counting out thousands upon thousands who are cared for in sanitariums, hospitals, free dispensaries, and "homes" of various kinds, besides those who are furnished medicine by dispensing physicians, you reduce the actual number of customers for each store to a surprisingly small number of persons. It is not to be wondered at that in these circumstances druggists should find it necessary to vend many articles outside of their legitimate line.

It is well known that many of the new stores owe their existence to the enterprise of rival wholesale drug houses, which houses are willing to incur considerable risk of loss in order to secure new patrons, to get at least a part of the business that has gone heretofore to their competitors. Another inducement for the jobber is the appreciation by him of the fact that if the young man is successful, or even moderately so, the jobber will have a permanent patron because of the retailer's gratitude for the assistance rendered him in getting a start.

The would be proprietor whose possession of a few hundred dollars emboldens him to bow his neck to the yoke of proprietorship of a small business would, in thousands of cases, be better paid and enjoy greater freedom from care as a clerk, but, buoyed up by false hopes in which he is encouraged to indulge by the salesman who expects to sell the opening bill, he makes the discovery when too late for his own good and that of the other druggists of his locality that there is a wide difference between the amount that comes into the till and the amount that remains after all expenses have been paid, however carefully these expenses may be watched.

The rapid growth of sentiment in favor of making commercial training a part of the curriculum of every school of pharmacy is most gratifying. It is now generally accepted that this training ought to be adequate to the proper conduct of a drug store, it should be obligatory upon every student, and that a thorough knowledge of this subject should be, in all cases, a prerequisite to graduation, if, indeed, it is not made a prerequisite to registration by the boards of pharmacy. In my opinion, this Section ought to recommend the passage by the Association of a resolution embodying these provisions.

To prevent the ruinous multiplication of stores it is necessary that clerks should receive such treatment as will make them satisfied to remain clerks. To this end more healthful sleeping quarters than many of them now have should be provided, and they should also have the shortest hours possible consistent with justice to the proprietors. There seems to be comparatively little dissatisfaction now in regard to wages, the great majority of clerks realizing that in proportion to what the proprietors themselves are earning they are well paid. In this connection I would direct attention to the extremely satisfactory results obtained by some pharmacists of paying there employees, in addition to

their salaries, a certain percentage on all cash business done. It is well known that, with excellent results to employers, nearly all traveling and other salesmen are paid on the basis of their sales. While it may not be practical to pay the employees of drug stores upon the basis of their *individual* sales, it *is* practicable to pay them upon the basis of the total business done, and there is no reason why this profit-sharing method, now used so successfully by many mercantile and manufacturing houses, may not be employed to fine advantage by retail pharmacies.

To prevent jobbing houses from encouraging clerks to start new stores in territory already congested or fully occupied, it has been suggested that concert of action on the part of those druggists who are threatened with an invasion ought to be used. That this method would not work satisfactorily in all cases is probable, but there have been instances where it has succeeded admirably, the interested jobbers preferring not to incur the enmity of the druggists of an entire community in order to gain one additional customer. Whether the end sought (undoubtedly a great boon) fully justifies the means employed to attain it, every one must decide for himself. Whatever the decision, this is one of the many illustrations which might be given of the power of organized effort, a power the value of which pharmacists have never yet fully appreciated.

Owing to the large expense of conducting a drug store on the plan which custom now ordains, it is necessary that the volume of business be large, otherwise the profit is certain to be unsatisfactorily small. In the cities and large towns, and even in the smaller towns, custom demands that druggists shall occupy the best located store buildings, and consequently pay larger rent (as much as fifty per cent. more in some cases) than any of their business neighbors engaged in other legitimate lines. Except in localities peopled with farmers or the working class, custom obliges the druggist to furnish his store with attractive fixtures, having a generous supply of mirrors; also with shelf bottles and show globes of recent pattern and numerous other up-to-date accessories. A superabundance of artificial light must be provided and the show windows ought to have constant, painstaking attention. All of these things necessitate outlay and expense.

Another reason why the volume of business must be large is that, owing to the complex character of his business, the average druggist is trying to do a commercial business with rather high-priced professional help. Through demanding a large percentage of profit he may overcome, to some extent, this disadvantage which he suffers, but many druggists have found to their undoing that the public will not now pay a professional profit for staple commercial articles. The time when this could be reasonably expected has gone by forever.

To be wholly successful, a drug store of the type to which we have become accustomed (I mean no disrespect when I term this a department store in miniature) ought to do a sufficient volume of business to justify the employment of salesmen or saleswomen to vend the commercial articles and skilled pharmacists for the professional work of the store. Any other arrangement than this gives the department store a marked advantage in the selling of commercial articles (which they can handle profitably on a very small margin), while the pharmacists of the store, upon whose knowledge and skill must rest the reputation of the business as a *drug* store, gradually lose their value because of devoting so much of their thought to merchandizing as to prevent their maintaining the requisite proficiency as professional men.

This brings us to consider the practicability of lessening the number of stores and increasing the volume of business done by those that remain through combining several stores under one roof in the hands of one management which shall place the various articles in different departments, each separate from the rest but an integral part of the whole, in accordance with the plan now so successfully carried out in department stores. The trend of all business is now toward centralization, because this means the lopping off of needless expense and the conserving of all the forces which enter into the success of a

business, the best possible use being made of thorough system. With our prejudice against department-store methods, born of wrongs we have been compelled to endure with such fortitude as we could command, it is not a pleasure to contemplate the drug store of the future as being a department store, but more remarkable changes in business methods are occurring daily, especially in the cities, and it may be the part of wisdom not only to accustom ourselves to the thought of this change, but to prepare to make the most of such opportunities as may be afforded.

Another method whereby the volume of business done by drug stores may be increased, is through reducing to the minimum the practice of self-dispensing by physicians. This will require a deal of well directed effort, the task being especially difficult in the towns and country communities. Here again is emphasized for us the necessity of concerted action. Recently in Chicago the druggists of a section of the city gave a dinner, at which were present more than a hundred physicians. In the speeches which followed the repast the relations of physicians and pharmacists to each other were freely discussed by representatives of both sides to the edification of all and evidently to the advantage, as results have shown, of physicians and pharmacists alike.

The topic which elicited greatest interest was the practice of prescribing the various makes of such galenicals as syrup of hypophosphites compound and other syrups, elixirs of various kinds, especially of the salts of iron and their various combinations, emulsions, wines, etc. The pharmacists present exhibited National Formulary preparations, which they themselves had made, and the showing was most creditable. The immense advantage to all concerned of prescribing National Formulary preparations, freshly made by pharmacists of known integrity, over the products of manufacturing pharmacists (the greatest merit of which products, even when fresh, is often the eloquence of the canvassers who urge their use) was carefully considered.

At this meeting there were discussed also the evils of counter prescribing, of refilling prescriptions in a manner detrimental to the physician, and of intolerant criticism and fault-finding among the members of the two callings, the outgrowth generally of ignorance of the facts in the case. As the result of this interchange of views it is certain that never have the physicians and pharmacists of that portion of Chicago realized as they do now the obligation resting upon them, to work for each other's welfare as a matter of self-interest, if for no higher reason. So salutary was the effect of this conference that arrangements are being made for others in the same locality, and I desire to recommend to pharmacists everywhere this method of increasing their business, namely, by cultivating the physicians through convincing them that you understand your business, that you appreciate and respect their rights, that you deserve their patronage, and that your co-operation is for them a valuable asset.

To conduct a professional store where only medicines and sick-room requisites are kept is the ideal of almost every young man who graduates from a school of pharmacy. Doubtless there are few men present who do not look back on the time when they yearned to conduct a pharmacy where only professional work was done, where the round of duties consisted of filling prescriptions, testing excreta, chemically and microscopically, certifying the purity of drinking water and milk, doing general analytical work, etc. What a pity this roseate dream is so seldom realized—that throughout the whole country there has been found room for only a handful of such stores. That the number of these stores can with advantage to their owners be increased does not seem probable, in spite of the preaching of some earnest, well-meaning men, whose devotion to pharmacy *as a profession* outruns their practical wisdom.

Recognition of the necessity of doing a larger volume of business has induced some pharmacists to deliberately take up price-cutting as a means of accomplishing the desired object. It is not to be denied that in those rare instances where the cutters' methods are not immediately adopted by his druggist neighbors (who generally outdo

him in giving away profits), this plan succeeds for the individual druggist who inaugurates it. But is not this success gained at ruinous cost to the great body of those engaged in our calling, and is that *true* success which consigns our brother craftsman (as deserving of success as we) to partial if not complete failure in order that we may profit thereby? It ought to be laid upon the conscience of the American Pharmaceutical Association to condemn the practice of demoralizing prices, when this is done for the special purpose of gaining an advantage over one's fellow-pharmacists, as wrong in principle and subversive of the association spirit to foster which spirit this organization was formed.

In re-reading the well-timed report of Chairman Meissner, of this Section, presented at the meeting last year, I was impressed with the strength of his contention that organization among druggists is the only hope of curing the commercial, as well as the professional, ills from which we suffer or which may befall us—the only means whereby needed benefits may be secured. Nothing I could say would be more profitable to the American Pharmaceutical Association or those to whom its benignant influence extends than to echo the sentiment that in organization only lies our prospect of success as a brotherhood, the future being promising or forbidding in proportion as we, accepting the inevitable, put our faith in the good ship Co-operation or float to destruction on the rotten hulk Individual Greed.

The following are a few of the evils which thorough organization among pharmacists will cure: Trafficking in human souls by means of vending cocaine, morphine, chloral and other worse than poisonous drugs; converting the back rooms of so-called drug stores into grog shops, defaming thereby one of the noblest of vocations; changing the patent laws of our country so that no one may find opportunity to gain government sanction for exacting tribute from our sick; substitution practiced by charlatans posing as reputable pharmacists of one thing for another in prescriptions, or the changing of the physician's orders so as to gratify personal greed, endangering the patient's life and the physician's reputation; the registering by State Pharmacy Boards of incompetents; imposition upon the ignorance and credulity of physicians, causing them to prescribe preparations which cost seventy-one cents per half pint, which the pharmacist can make just as well at a fraction of the cost, greatly to the advantage of all concerned; self-dispensing by physicians, especially where this practice is prompted by the physicians participating in the profits of manufacturing the nostrum prescribed; the abuse of the free-dispensary privilege, whereby persons abundantly able to procure their own medicines are supplied at public expense; price-cutting on prescriptions and everything else which druggists handle, whereby the profits of all are sacrificed, with advantage to no one except an unappreciative public; wholesalers selling at retail at wholesale prices; "dead beats" imposing as long as possible on one pharmacist and then transferring their accounts to the books of another of the unwary; the senseless multiplication of stores, with no permanent advantage anywhere except to real-estate owners; the unintentional employment by pharmacists of clerks who "booze," and of others who divert their employers' money into their own pockets, the bad character of these men being fully established but not known to the constantly increasing number of their victims. This list might be extended so as to include many other abuses of varying degrees of hurtfulness, but this enumeration will show conclusively the great need of concerted action for defensive purposes.

Even thorough organization among retail pharmacists will probably not introduce the millennium, however great may be the advantages gained. Doubtless wrongs against which we must contend will continue to present themselves, but the ease with which even the most difficult problems can be solved by the combined wisdom of those engaged in our calling, when contrasted with the extreme difficulty of correcting even a trivial abuse without this help, emphasizes the wisdom of making the most of this irresistible power we possess but have never used—organization.

In studying the subject of the Association's duty to commercial pharmacy I have been struck with the richness of this field of usefulness, as well as the fewness of those engaged in converting the rich ore of opportunity into the coin of common advantage. What we need—what we must have if the A. Ph. A. means to fulfil its whole mission—is a greater number of workers in this field; unselfish men willing to devote their time and talents that the welfare of all may be advanced. To this end pains should be taken to publish near and far, by means of facts, not words alone, that the Association is not more interested in the work of *any other section* than in that of the section on Commercial Interests, and that it earnestly desires to make, and intends to make, this section serve to the fullest extent possible the interests of every retail pharmacist in America.

The address was received with prolonged applause.

THE CHAIR: Gentlemen, you have listened to this able and very interesting address. What is your pleasure?

On motion of Mr. Hancock, seconded by Mr. McIntyre, the address was ordered received and referred to the Publication Committee.

MR. WOOTEN: Mr. Chairman, I desire to bring out some of the points made in this paper for discussion, and believing that the best way to do that is by means of resolutions offered, I have formulated a few resolutions which I desire to have considered. You will understand, gentlemen, that these resolutions, if adopted, must go to the general session for ratification. I trust that in considering the resolutions you will be guided by your sense as to whether the American Pharmaceutical Association ought to send the resolutions out. You will please understand, also, that these resolutions were written for the purpose of stimulating debate, primarily, and in discussing the questions you must decide for yourselves whether the American Pharmaceutical Association wants to adopt in general session the resolutions proposed.

Mr. Wooten then presented the following as the first of the series of resolutions he had to propose:

*Resolved*, That it is the sense of the Association that retail pharmacists will advance their individual interests, and the interests of pharmacy as a whole, by making the working hours of clerks as few as possible, consistent with the proper conduct of their respective stores; also by providing clerks with healthful sleeping-quarters, and by liberality in the matter of compensation, the end sought being to bring into the profession of pharmacy a greater number of capable and ambitious young men who will otherwise be deterred from entering it.

Mr. Wooten moved the adoption of the resolution, and the motion was seconded by Mr. Meissner, and carried.

MR. WOOTEN: Gentlemen, I shall be disappointed if you do not discuss these questions. As I explained to you, the resolutions were written for the purpose of getting debate on them.

Mr. Wooten then read the second resolution:

*Resolved*, That it is the sense of the Association that the several schools of pharmacy ought to include in their curricula a course of commercial training comprehensive enough to insure that the student is fully capable of properly managing a retail drug bus-

iness, the passing of a satisfactory examination in this branch being a prerequisite to graduation.

The adoption of this resolution was also moved by the author of it, and Mr. McIntyre seconded the motion.

MR. SHERMAN: I would like to ask the mover of this resolution what he had specifically in mind when he said "sufficient commercial training?" I would like to know just what he means by that.

MR. WOOTEN: It is pretty hard to tell just all the things in my mind when that was written. We are all familiar with the great number of wrecks to be seen strewn along the stream of pharmaceutical progress, of young men who have gone down in their commercial endeavors, due to the fact that they started out in the first place with a wholly inadequate conception of the manner in which a drug store can be properly managed. They did not count the cost of doing business. Some of them were never at any time able to tell you how much it was costing them to do business. They probably gave judgment notes to some wholesale house to which they owed money, or they gave mortgages which proved their ruin. There is a whole broad field of education which the average drug clerk does not understand, by reason of the fact that he has never had any other training than that which he may have received in the drug store, having entered the drug store when a mere lad and grown up with the business, and being a perfect child all during his career with reference to business methods. How comprehensive this instruction in business methods ought to be those who have had experience in teaching a course of this sort in colleges of pharmacy can better tell than I can. I would say, though, that the course ought not to be less than usually had in business colleges.

MR. PAYNE: Is it the idea of the Chairman to give the young man that preparation that we generally find comes from contact with men of affairs—that we usually get in the world, and which we usually do not get in college, whether we study medicine, pharmacy, law or anything else? It is very necessary, but is it practical for the college to give such an education? Is it knowledge of affairs that you refer to there, or is it bookkeeping?

MR. SAYRE: I belive we had, some two years ago, a very valuable report on the question of a business course as a portion of the curriculum of a college of pharmacy presented to us by Mr. Ryan. It was published, I believe, in the Proceedings of some two or three years ago. If Mr. Ryan is in the house, I would like to ask him to assist us by giving us a talk on that specific question. It seems to me it is a mistake to ask of the colleges of pharmacy, who are responsible for the training of the young man in pharmacy proper, that they give a considerable portion of their limited time to such a training as is usually given in a business college. As I understand, the usual training in a business college comprehends two years of solid work. Now how much of materia medica, how much of pharmacy, how much of chemistry can be given, if we give that much of a business training in the college of pharmacy? I might say before I take my seat that it was through Mr. Ryan and others interested in this work that the University of Kansas has adopted a course of ten weeks in business training, and a gentleman who is a member of the legal department of the university—a young man—gives the course, and lectures on lines affecting pharmacy, and upon the questions which arise naturally in the prosecution of business. It seems to me, in answer to the question that has just been propounded, that a course embracing a series of lectures for not longer than ten weeks, and not over two hours per week, would be about all that a college course of two years would admit of, because every instructor is fully aware that it takes every minute

of the student's time to do the actual work necessary in chemistry, pharmacy and materia medica; also the work on the different parts of chemistry, urinary analysis and pharmacognosy has increased very materially. I have a paper on that subject which I hope to read in the Scientific Section. The work has so developed in the various lines that it seems to me we have not the time in a two-years' course to do this other work thoroughly. We ought to extend our course to three years, of eight months each, in order to get in all the work that is necessary.

MR. ELIEL: I am in full accord with the idea that the pharmacist should have a commercial training. But we must bear in mind one fact, and that is that the business man is born, you can't make him. You can't make a business man out of the young man by simply giving him a commercial training. You may give him some ideas, of course, but you cannot make him a business man thereby. As Mr. Sayre has so well stated, the time in which to obtain the necessary technical education, with the modern development in pharmacy, is so fully taken up that the terms should be lengthened out. The time is hardly sufficient now to obtain the knowledge that is absolutely necessary for the pharmacist to successfully carry out the various things which he is called upon to do. If the colleges of pharmacy would raise their standards of admission to at least the equivalent of a high-school education, that would give the student an opportunity to get the necessary commercial training before he matriculates; that is the time for him to obtain it, before he enters the school of pharmacy. [Applause.] He ought to be able to stand an examination on that, as well as on the requirements in other directions; and when he has that knowledge and the proper technical education, if he is sharp and shrewd he ought to be able to conduct his own business affairs when he embarks in business for himself.

MR. HELFMAN: Mr. Chairman, I do not think that there would be any disposition on the part of any of this audience to question the wisdom of that resolution if it made a little clearer the matter of distinction between a mere clerk and a business man. The two are as wide apart as the poles, and the amount of training that the average young man gets in a business college does not qualify him to become a business man in the larger sense of the word. The mere ability to write a note or keep a double-entry set of books is not a business education. Our great universities which are now going into the field in the wider sense, are they attempting to educate clerks? No, sir; they are teaching the science and laws of trade in the broadest sense, so that a man may become a real merchant. Then in actual business he learns how to buy and sell, how to utilize discount, how to advertise and so on. I hope that Mr. Ryan, who had a good deal to do with the institution of a commercial course in the Philadelphia College of Pharmacy, will give us some points in his experience along that line.

There were calls for Mr. Ryan, who arose and said:

I do not know that I have much to say, gentlemen. As to the experience I had in teaching commercialism, business training, &c., in the Philadelphia College of Pharmacy, I will say that the course was instituted because of the conditions that existed at the time. No one will contend for a moment, of course, that a student who comes provided with a business training would of necessity have to take that course in the college of pharmacy—in other words, make it an obligatory part of the course. The facts in our case were, that we knew the students who came to our institution did not have such a training with reference to the laws of business. I believe any college of pharmacy is perfectly competent to instruct its students in any branch, or in any part, of the occupation the student will follow, in order to make him a successful druggist—either professionally or commercially; and it was on this principle that we took up the teaching of

business matters.' The facts were that many of the young men, although they had been in stores for two or three years, had absolutely no knowledge at all of the commonest laws of business. Their proprietors did all the buying and paying of the bills. They were never in touch with the channels of trade, and didn't know where to go to purchase this, that or the other to advantage. The student didn't know how his obligations were to be settled; he didn't know what a note meant; he didn't even understand—as I had come to my personal observation — that when he gave a note the thing he had to see to was that the money was in the proper bank to meet it when the note fell due. I remember one instance especially where the student thought that when he gave his note, the gentleman to whom he gave it would bring it around some day and he would pay it, the same as he would a bill.

So far as teaching business methods in a school of pharmacy is concerned, no one would advocate for a moment the institution of a course so complete as is given in the average business college of good standing. This involves all sorts of business—railroading down to the finest point; insurance in the technical sense, and every form of business that you can well imagine; transportation, and everything of that sort. This, indeed, does require time and systematic instruction. But I do claim that it is very much better for the college of pharmacy, and that the young man will leave that college with greater hope of success if the students are instructed in the rudiments of business. You do not expect to perfect him in this subject any more than you expect to make a successful professional druggist by a college training; if he does not go on studying and practicing what he has learned professionally he will not succeed professionally, and the same is true as to a business course. But if you give them a few starting points and put them in the right way, is it not reasonable to suppose that the young man who has had a taste of this branch of knowledge will look further into the subject and acquaint himself better with it, even with this slight foundation? It seems to me it is entirely possible for any college of pharmacy to give a ten-weeks course of two hours a week to this subject of a business training. And I tell you, gentlemen, you can teach a lot in that time. You can put the germ into the minds of a good many young men, who will follow the subject up and come to see that there is something in knowing how to do business and how to attend to the business side of his occupation. [Applause.]

MR. MAYO: Apropos of the result of this teaching in commercial colleges, I heard an excellent report read by the chairman of the Committee on Credits and Collections at the Monterey meeting of the N. W. D. A. He went into some detail as to the colleges which had instituted a commercial course, and said that the results of the spread of knowledge of ordinary commercial forms which followed the institution of this course were quite noticeable upon the trade relations between the retailer and the wholesaler; that it had helped the retailer to a better understanding of his business and minimized the trouble arising from mere routine business forms between the two. The N. W. D. A. certainly appreciates the good work that has been done, and hopes that it will be carried further.

MR. CASPARI: We tried this plan of a commercial training in the Maryland College of Pharmacy immediately after the reading of Mr. Ryan's excellent paper at the Richmond meeting. Our trustees took up the matter then, and we introduced such a department in our college. Our system does not consist of lectures twice a week, but consists chiefly of laboratory methods, by which the students are instructed for three months, six hours a week, in business forms particularly applicable to the drug business. Mr. Hynson is in charge of that department, and the students are instructed in commercial paper, the meaning of indorsements, notes, mortgages, insurance and things of that kind. And then they practically carry out these instructions in the buying of things we need in the college, auditing the bills, taking advantage of discount, and paying by check or

note. They are also taught the value of their indorsement of promissory notes by showing them the danger of indiscretion along this line. We have found that even this limited instruction has been exceedingly valuable to the students, so much so that students we graduate write back to us that they appreciate as much as anything the comparatively small amount of commercial training received at the college. I think every college is able to give a certain amount of commercial training successfully; the field is open for all colleges. And while there is no doubt that the extension of the college course for three years would greatly amplify the opportunities for instruction, yet even in a two-years course this training in business methods can be given with good results, and I think the subject is deserving of a great deal of attention at the hands of the different institutions.

MR. LAMPA: I deem this particular feature one of the greatest importance. I do not mean to imply that it is necessary for the young men to have a complete business education, but contact with scientific men demonstrates one thing, that in the course of their career, in order to obtain a scientific education, they do not get an opportunity to obtain an idea of the common business methods pursued in ordinary business life. Now by talking with these men this thing becomes very evident, and it is well-known that people who pursue scientific investigations—and druggists are to a large extent scientific men—lack the knowledge of how to buy and sell and the common routine of business; in that one particular they are wofully deficient. Every other business has realized the fact that by proper instruction they can be developed in their particular line of endeavor. I might mention the life insurance companies, which have a special department for explaining to their men the details of their particular business. This is practical, it seems to me. To the young man who is pursuing a scientific education it is imperative that he be given some idea of the business methods necessary to conduct his business successfully. It does not require any long or expensive course of training, and by proper instruction in the schools, we will turn out a class of pharmacists who will be business men, and who will be a benefit to the community, a benefit to themselves and a credit to our institutions of learning.

MR. W. A. HALL: I want to speak a few words to emphasize the position taken by Mr. Ryan in support of the resolution. At one time I had in my employ a clerk who was a graduate of a high school and a college of pharmacy, who I had reason to believe would prove to be quite an efficient man, but whom I found as absolutely ignorant on matters of business as one could well imagine. He could not even make a proper charge on an ordinary account, or issue a proper receipt; he knew nothing about a check, or any of these things that come in the commonest commercial transactions. Now I judge what the mover of the motion had in mind was that kind of instruction that would overcome such deficiencies as that; that we should give them instruction on the fundamental ideas of business. I make it a rule in my own business to have my clerks in whom I have confidence become familiar with the bills, invoices and details of the business—that these things are open to their inspection—and I tell them I want them to inspect the details and acquaint themselves with the prices, and I take pains to acquaint them with the sources of supply of goods, and teach them discount and so on; I try to instruct them along these lines. Now if a certain amount of this could be done before they went into business, it would help matters a great deal and would facilitate their usefulness. I simply mention these facts as touching upon the point in question.

MR. EBERT: Now we have heard from all the professors! (Laughter.) Now let us look back instead of looking forward. It seems to me that the great commercial colleges do not do just what these professors tell us they do—teach the young men how to do business. One thing our colleges of pharmacy have done is to ignore the apprentice

training. We have talked about taking the high-school graduate and putting him into the college of pharmacy, where we expect to make a business man out of him; we expect to make him in the school and in the college of pharmacy. I never believed that was the proper way to do it. I believe in the little boy you take into your store as an apprentice—the old-fashioned way in years gone by; the way I was raised. In those days he washed the windows and swept out the store, and he got all the business training he wanted before he had time to open a drug store. I know I am talking against time—you have gone beyond me; but I have always believed that was the true way. And the boys who were taught that way have become the most successful druggists of this country. [Applause.] They are not up to the tricks of cutting, under the present commercialism, but I believe they have had good training nevertheless. They may not have been as scientific as some of you gentlemen who have graduated at the high schools and gone through the colleges of pharmacy of the present day, but I am sure they made the best druggists of this country, and I never expect to believe anything else. [Applause.]

MR. DEWOODY: I want to thank the brother for so fully saying what I would have liked to express myself. I just want to say this, that the recommendation is scarcely definite enough as to the scope and method of this department of commercial training. If it is to teach the boy to write a receipt, why the employer has no business being in the business—and he won't be long—if he can't tell the boy. I have a boy twelve years old that makes calculations of long accounts on the books, and he can enter a credit correctly. If he couldn't do it, I would think his school teacher had been remiss, and his father more so. I think that colleges of pharmacy have enough to do to give them a good training in pharmacy, chemistry, botany and materia medica. I do not know that you could give them a commercial training without a commercial department under experts; and even then, as has been stated here, you could not make a business man out of some of them; business men are born, not made, as Mr. Eliel has said. The suggestions made here thus far seem to be along the line that the young clerk in the store is unfamiliar with the *kindergarten*. I might call it, of commercial training. Well, he can buy the books for four or five dollars, and read and study them instead of the baseball column in the newspaper or the latest novel, and he will learn more than the average professor of pharmacy knows about business. [Laughter and applause.]

MR. HOPP: I want to endorse what Mr. Ebert has said on this question of apprentices. I have had boys to come to me from the colleges of pharmacy that didn't know how to wash a glass. Give me the young man who has had a practical, every-day store training for a couple of years, and then goes to the school of pharmacy for two years, and he is worth a great deal more than the ordinary clerk who has simply had a pharmaceutical education. [Applause.]

A MEMBER: The American Pharmaceutical Association is supposed to represent the drug business in all lines, and if you go around the country and look into the drug stores you will see about the worst business methods you will find anywhere. No kind of business is as badly conducted as the average drug store. The man who graduates from the college of pharmacy wants to be a professional man, and when he gets into business he finds he is eight parts business man and one part drug man. He has got to be that. Now we do not want to look backward, as Mr. Ebert says. We want to look forward. Things have changed since Mr. Ebert's day, and I think if a college cannot give this instruction it is a mighty poor college. A good business instruction would be of very great benefit to every employer, too. The apprentice idea was a very good one—I have been an apprentice myself, but that time is past, and I believe in some business training, that it would be a benefit to everybody.

MR. BARTELLS: If this is an experience meeting, I would like to tell a little experience. [Laughter.] Not a Methodist experience, but a commercial experience. Some thirty-four years ago I took into partnership a young man that had been through the commercial school. I had just come out of the war a few years before, and my education had been arrested by that cruel strife, and of course I trusted my business management mostly to him. He got his diploma and hung it up in the store, and the bookkeeping and the management were given to him, and I had the sweeping and cleaning and attending to the store generally. [Laughter.] It just lasted about three months, when on investigation I found he had everything all mixed up. Accounts he had charged to one man belonged to another, and things like that. He was an excellent good fellow, and honest every way, but decidedly incompetent to run a business, and we had to make a change. Now I want to call attention to one fact Mr. Eliel brought out—that you can't make every boy a business man. There are plenty of clerks; plenty of young fellows who will do very well as clerks. I had another man in my employ after I got rid of my partner with the diploma, who was a very fine looking man—better looking than I am. He also had been a man of this kind, and he started to run a store and was a failure—broke up in business. He was able to attend to the selling of the goods, and could keep the store in good shape, but he had no idea of running the business end of the thing—sort of a commercial "fakir," you may say. And you will often find that is the case. It seems to me that no student ought to enter a college of pharmacy not possessing a high-school education and other requirements. I do not think these things ought to be mixed up with the college of pharmacy. It has been said here that ordinarily our scientific men are not business men. This is true in religious science, too. I have had a good deal of experience with ministers. [Laughter.] Some of you may have had the same. They have had a college training and a theological course, and all that, but when it comes to business matters they are like children. So the thing is; we must make a distinction: some are born clerks, some managers, and others failures; and when they go in for this last they will make a wreck, no matter how much training they have had in the commercial schools, or any other kind of school. They will do well perhaps under somebody else to do the head work, but they are not built that way themselves.

MR. HALLBERG: Inasmuch as the business men have had so much to say, it seems to me those who are not business men should also say something. What is the Department of Pharmacy except business? It requires a great deal of hard work on the part of the teacher of pharmacy to point out the necessities of not following the ordinary business methods in the practice of pharmacy. If, for example, a customer comes in and wants five cents' worth of Epsom Salt, the business man—the average business man, without pharmaceutical considerations—is likely to say to himself, Now that stuff is cheap and I will give four ounces (or possibly half a pound) for five cents. A German woman will come along and want five cents' worth of "*Augen-nicht*," and when he discovers what this means, the business man knowing it is very cheap, and desiring to make a good impression on the customer, will give a couple of ounces of sulphate of zinc, while the pharmacist would only give two grains. [Laughter.] It is the privilege and the duty of the professor of pharmacy to explain these matters, and if the teacher in pharmacy has had the kind of business experience that Mr. Ebert refers to, he is able to do that, and the graduates under his instruction naturally will go out far better business men than those who have not learned these little business points—these little tricks in our trade which are so exceedingly necessary. [Laughter.] I do not object, and I think it might be a good thing for some one connected with the teaching institution, if he has got the ability and experience, to show how notes should be drawn, and possibly instruct the students in some simple method of book-keeping, but further than that I do not think

there is any necessity for such course. But I believe every teacher of pharmacy should endeavor to point out all these little details about the different articles that come up in the regular business of the pharmacist—that is, how to get the most money for the least quantity of the article that he sells.

MR. KIRSCHGESSNER: As to the question of apprentices, most of those that I know of have very little education beyond the second grade, and I will say that those who have been successful by having the training of sweeping out the store and washing windows, as Mr. Ebert has said, would find the conditions very different to-day from what they were when they went into business. I think they will find that it is the man with the education, combined with the sweeping ability, who is the successful man now. It is the man educated in commercial training that is successful in business, and goes by leaps and bounds over those who are just brought up in the drug store.

Mr. Wooten said he would like to read the resolution again, as possibly some amendment might make it entirely satisfactory; that he did not believe the members thoroughly understood it. He then re-read it.

There were calls of "Question," and the chair put the vote on the motion to adopt the resolution as offered, and it was unanimously carried.

Mr. Wooten then read the third resolution, moving its adoption:

*Resolved*, That it is the sense of the Association that retail pharmacists will greatly increase their prospects of success as business and professional men by inaugurating occasional conferences between their respective local organizations (of which there ought to be one in every community) and the physicians of their localities, in which conference there are brought up for discussion the relation between the physician and pharmacist to each other and of both to the public, it being confidently believed such conference will benefit all concerned.

Mr. Hopp seconded the motion to adopt, and it was carried.

Mr. Wooten read the fourth resolution, and moved its adoption:

*Resolved*, That it is the sense of the American Pharmaceutical Association that price cutting on proprietaries and other goods, inaugurated and carried on for the specific purpose of gaining advantage over one's fellow-pharmacists, is wrong in principle and subversive of the Association spirit, to foster which spirit this organization was formed.

Mr. Boring, of Philadelphia, seconded the motion to adopt. Carried.

Mr. Wooten then read the fifth and sixth resolutions, bearing upon the same subject, and moved their adoption:

*Resolved*, That this organization deprecates the feeling said to exist in some quarters that the American Pharmaceutical Association is not in as hearty accord as it should be with the efforts which the retail pharmacists of the country are putting forth individually and collectively to improve their financial status.

*Resolved*, That the Association heartily commends all such endeavors and cordially urges upon pharmacists the desirability of identifying themselves closely with their respective local and State organizations, the National Association of Retail Druggists and the American Pharmaceutical Association, the commercial section of which devotes itself exclusively to subjects of vital interest to those engaged in conducting retail drug stores.

Mr. Claus, of St. Louis, seconded the motion to adopt the resolutions just read, and the motion prevailed.

Mr. Good then moved that all these resolutions thus read and acted upon be referred to the Association in general session, for adoption and confirmation. Mr. Mittelbach seconded the motion and it carried.

Mr. Wooten resumed the chair, and called for the reading of a paper by Mr. Ralph B. Gable upon the advantage of the store window rightly used. Mr. Gable presented his paper as follows:

## A LOYAL BUT NEGLECTED SERVANT.

BY RALPH B. GABLE, NEW YORK CITY.

The store window is the right hand of fellowship extended to the passer-by. It is the smile of welcome to him who would enter. This, let me say, is not putting a sordid construction on the office of the window. It is simply a recognition of the fact that the fabric of present-day pharmacy is not unlike those of which our garments are made: it has two faces.

It is not my purpose here to delineate window displays or to propose a series of plans for filling windows with novel and attractive arrangements of goods. My sole object is to bring conviction to you that in the window placard you have a loyal but neglected servant. The placard is the one medium through which the average pharmacist can tell store news from day to day, from week to week. Except in a relatively small number of cases, he cannot use the newspapers, and the folder or booklet is issued so seldom that the advertiser finds it rather difficult to infuse the all-important element of timeliness into his bit of printed matter.

I want to commend the man who uses placards relative to his various simple home remedies and the toilet helps that he prepares. At the same time I am constrained to protest against the skeleton type of placards so often seen. What I mean by "skeleton" is a mere name printed or painted on a card. Let us have flesh and blood in placards; let us have evidences of life. I suppose my idea can be most strongly emphasized by asking you to imagine that you see a card, bearing these words, in a window: "Choice Perfumes." A little farther on your eyes catch this message: "Climax Violet Extract. Dainty and sweet as the flowers with dew still on them." Or, perhaps, the words before you are, "Climax Rose Extract. A wealth of summer sweetness in every drop." Which card, may I ask, would make the best impression on you?

Advertising is, broadly speaking, notification, information, suggestion, and your placards should comply with this definition. If they do and you use them regularly and systematically, they will do effective service.

In conjunction with the prediction contained in this last clause, I want to mention a few examples of successful window advertising. A druggist located in one of our large western cities became interested a few years ago. He tried them and before long had tangible evidences of results.

The volume of his business increased and he created a sale for a number of special preparations. Nine years ago he was doing a fairly profitable business, but to-day it is twice as large as it was in 1894. In order to prevent any misconception as to the character of his business let me say that this pharmacist has a thoroughly equipped laboratory; that he makes a large line of pharmaceutical preparations, and is prepared to make analytical and microscopical examinations for physicians. His prescriptions during 1902 numbered 12,000. He advertises in various ways to the medical profession, but the public he reaches chiefly through placards.

A few years ago a firm opened a pharmacy in the down-town district of New York. The bulk of the advertising thus far done has been by window cards. The window in question is a very large one, and a great variety of goods are usually shown at one time. Sometimes there are as many as thirty placards used. And they are read. One can go to the store at any time from 7 a. m. to 7 p. m. and find an interested group in front of the window. The business is steadily growing.

Numerous instances might be cited in support of my belief that window cards comprise good advertising for the retail druggist. But such illustrations would not necessarily prove helpful to the man who might be casting about for new methods of advertising. So I will pass on to other considerations.

"Talking points," or what to say may puzzle some pharmacists. In fact the writing of bright, snappy placards, may seem so difficult that many will hesitate to try. Let me repeat here, therefore, some remarks that I made on another occasion in reference to the value of persistence.

Dexterity in any part or in any phase of business can only be accomplished by careful, painstaking work. Watch an experienced pharmacist as he wraps a package for a customer. He makes the folds of the paper and the end flaps of the package quickly and neatly. He deftly adjusts the string, ties it, and the package is finished. There are no creases in it showing repeated efforts; there are no unsightly wrinkles, no broken corners. That package is at once the envy and the despair of the apprentice. He knows nothing, however, of the failure, perhaps the humiliation, of past years in doing just such work. He knows nothing of laborious practice at odd moments in the early days of that pharmacist's career.

What we have just said regarding the junior clerk and wrapping packages may apply to the druggist who thinks he bungles fearfully when he tries to write an advertisement, and who wishes he could express himself as clearly and aptly as one of his competitors does. The druggist forgets the saying so often quoted that "ease is the lovely result of forgotten toil." He forgets how he perspired when he first began to make pills, and how he worried about faulty packing of percolators. Time has removed the sting of failure. He has forgotten that sometimes he had to make a half score of efforts before the results were even passable. So we would remind your readers that the writing of good advertisements means careful work; it means revision and change; it means frequent failure. But patience and persistence will bring capability in advertising just as it will in any duty which comes to hand.

We come now to a few suggestions about subjects for placards. One of

the primal elements of value in placards is that they can be made suggestive of immediate needs. In a cold snap in winter you can refer to hot-water bottles, lotions, and creams for chapped hands, and to a preparation for coughs, if you make one. If your store is equipped with an apparatus for hot soda, a drop in temperature in the cold months may be a favorable time to display cards about hot drinks and reminders about atomizers may not be out of order at the same time. Moth preventives have their seasons, and the same may be said of sponges, chamois, disinfectants and other house-cleaning helps. Spices are not always in demand in summer and fall, and paraffin, for sealing jelly, would find a ready sale at the same time. Flavoring extracts are used all the year round, but most largely at holiday times. Seasoning herbs are likely to be called for around the time of the winter holidays. Egg dyes have their special season and soda water is the beverage of millions all through warm months. Then there are some topics that should be regarded as perennially appropriate. Prescription work is one of them, others are the following: hair brushes and hair lotions, tooth brushes, washes, powders and paste, toilet waters, perfumes. cigars, cameras, photographic chemicals.

Some of the articles or classes of goods here mentioned may seem trifling. My only excuse for offering them is that they go to make up the stock of many thousands of pharmacists. If you exclude all the trifling things from your window advertising, you will take away certain possibilities in telling store news. Your cards will soon become monotonous, stale and unprofitable.

The next point to be considered is the style of conveying your message. I know full well that many druggists decline to consider placards because of the expense involved. It is a source of satisfaction, therefore, to bring before you a plan whereby expense is reduced to the minimum. You can be as economical or as luxurious as you like in carrying it out.

Go to a sign letterer or a picture-frame maker and have him make for you from six to ten mats of heavy card-board. These mats are to serve as frames for your placards. The mats should carry all the decorative or eye-catching features, and should be cut to inclose cards of various dimensions. The sides of the elongated parallelogram comprising the mat should be from 1½ to 3 inches wide. Your mats should be of various dark tints—grays, browns, blues and greens. This series of mats is, in a sense, the groundwork of your placard work, for each mat in its turn may play many parts. For a national holiday, fasten a tiny silk flag in one corner of a mat and ranging down the other side place a "cut-out" in colors of the benign figure that stands for our country—Uncle Sam. At Christmas time let several of your mats carry sprigs of holly. For a tooth-wash mat get a smiling face. For a liniment use a picture of a foot-ball player. For soda-water beverages have a sign painter make you several pictures of glasses of soda water. See that the froth is made particularly

heavy and in it cut a small slit into which you can insert a straw. Pictures of berries and fruit will also serve you well in arranging mats for soda water. A picture of a lily, a shield, a knight in armor, or a policeman will help you in getting up a card for a disinfectant. Gibson girls will do valiant service in cards about talcum powder, perfumes, or toilet waters. A small ear of corn affixed to the corner of a card may help to have your message about corn cure read. Pictures of feet of various kinds and sizes may also answer the same purpose. A few bars of music printed on the side of a mat may be used as an accompaniment to your mention of the liquid music that you have in the shape of a favorite perfume. These suggestions are sufficient, I think, to show that the possibilities of decorative features are practically unlimited. Discarded lithographs, popular periodicals which print half-tones on heavy paper or used colored plates, old illustrated catalogues of various kinds will be of great help in affording ideas as well as material for making placard frames attractive. Pictures are a universal language. They tell some stories without a word of explanation. The cards on which the wording appears should be ordinary white, light-weight bristol board. Use only black ink in lettering your cards and no fancy or involved forms of letters. Avoid long-bewildering curves and scroll work. Go to your local printer and have him give you samples of printing in French Old Style or Elzevir type. Better still, have him print several selected paragraphs for you in which all the letters of the alphabet occur. Then you can have models of letters before you at any time.

Once more I want to sound a note of warning about the way you word window cards. Try to make them bright, crisp, persuasive, timely, suggestive. I'm going to read the words of a few placards that I know have been used with good results.

It's easy to train a child to watch the teeth. Buy our tooth wash.

Thin hair makes you look old. Why not try Lavender Lotion.

Smoke "Di Bazan" if you're tired of heavy cigars.

Good vanilla extract is rare. You can get it here.

The missing link to comfort—our corn cure.

A ticket to Comfort costs 5 cents. At the soda fountain.

There's a man inside waiting to quench that thirst.

Fortunate is the child taught to use our tooth wash.

Every lover of dainty odors will like our violet water.

Choose blindfolded from our stock of tooth brushes and you'll be safe.

We have every kind of a hair brush but a poor one.

It's easier to put on a chamois vest than to put off a cold.

Chemical helps for amateur photographers.

We ought to be selling more hot-water bottles this kind of weather.

Silver toilet needfuls. None so high as to be extravagant; none so cheap as to shut out goodness.

Keeping faith with our public has built up our business.

These various wordings are presented not as models of elegance, but all, I think, have the merit of not being perfunctory or conventional, and they serve to emphasize my injunction against the skeleton form of placards.

Mr. Gable's presentation of his subject was applauded.

THE CHAIRMAN: Gentlemen, you have heard the reading of this excellent paper, is there any discussion? What is your wish concerning it?

On motion of Mr. Anderson, the paper was ordered referred to the Publication Committee.

The Chairman asked the Secretary to read a paper offered by Mr. A. B. Rains, of Columbia, Tenn., upon the question of reduction of the tax on alcohol, which he did, the following being the text of the paper:

## WOULD THE ABOLITION OR REDUCTION OF THE TAX UPON ALCOHOL BENEFIT PHARMACISTS?

BY A. B. RAINS, COLUMBIA, TENN.

We think the question demands a negative answer, and have been very much surprised at the action taken by the different associations, both state and national, all over this country, in passing resolutions favoring such a step, and can but conclude that the effect of such resolutions were not considered beneath the surface.

We are unable to understand how any citizen of the United States would be benefitted by such action, save the manufacturers of patent and proprietary remedies, whose prices are purely arbitrary, and not regulated by supply and demand, as are the prices of the pharmacist. It will so cheapen the cost of nearly every item sold by the pharmacist that the inevitable force of competition will drive prices down and down until the volume of business will be so small that the volume of profits will be seriously impaired.

Nor can any argument be made upon this question as a matter of public policy, for the reason that the tax upon alcohol is for internal revenue, and should this be abolished, the U. S. government would be compelled to raise a like sum by direct taxation to meet the deficit. Nor can it be claimed that the consumption of drugs will be perceptibly increased on account of low prices, as in other lines, as no one takes medicine for the love of it.

The question upon its surface looks enticing to the pharmacist, as his immediate profits would be largely increased upon the first few barrels of alcohol purchased, but when you cheapen the menstruum that saturates his whole business, you cheapen the business itself, and although his per-centum of profits would be as large, or even greater, the volume of his business would be so materially reduced that his volume of profit would be

greatly diminished. Upon exactly the same principal the diamond merchant could not make a living if the value of diamonds were reduced to ten cents each.

Perhaps a few simple examples may serve to better illustrate our position. Before the tariff upon quinine was abolished, and its market value was four to six dollars per ounce, the retailer derived a profit of from one to two dollars per ounce, while to-day he realizes only ten cents. We presume the average price in the states for one ounce saturated solution potassium iodide is 25 cents, and the profit is 12½ cents, while if this salt was worth only 50 cents per pound, the price for the solution would not exceed ten cents. We might further illustrate with the history of petroleum oil and every other commodity that has suffered a great diminution in value.

Should the tax of two dollars and fourteen cents per gallon be abolished the price of alcohol would be 30 cents per gallon, or about the price of good distilled water, and tinctures would soon sell for one or two cents per ounce, and fluid extracts for very little more, and toilet waters and perfumes in the same proportion. We do not claim this would be the immediate but unquestionably the ultimate result, just as surely as history repeats itself and water seeks its level. We can but suspect that the manufacturers, who have so often been rebuffed by Congress, are now the power behind the throne in this movement, and are endeavoring to accomplish their ends through our State and National Associations.

We are aware of the fact that the present measure advocates the abolition of only $1.40 or two thirds of the tax, but can only say that if the maximum dose will prove fatal, two-thirds of the dose will make the patient mighty sick.

Mr. Meissner, seconded by Mr. Claus, moved that the paper be received.

MR. MEISSNER: Mr. Chairman, evidently Mr. Rains is misinformed as to the amount of reduction intended and the effect it would likely have. By a resolution passed by this Association at Philadelphia, we favored a reduction in the tax, without specifying the amount; and the N. A. R. D. and the various State associations have also passed resolutions favoring a reduction in the tax. The proposed reduction would bring it somewhat lower than the war-tax of 1898—or somewhat lower than it was when the war-tax went on. This reduction would make a difference of less than ten cents a pint in the cost of alcohol, or about a quarter of a cent an ounce on tinctures made with dilute alcohol, and I doubt if there would be any reduction in the price charged for tinctures: I fail to see why there should be. Therefore, I feel it would be safe for the retailer to have the reduction, and I hope this Association will again adopt a resolution favoring a reduction of the tax on alcohol.

The chair then put the motion to receive the paper and refer to the Publication Committee, and it carried.

Mr. Mittelbach was then invited to read a paper he had prepared upon the commercial training of apprentices, and he presented the following:

## COMMERCIAL TRAINING OF THE APPRENTICE.

BY WM. MITTELBACH, BOONVILLE, MO.

There is no doubt in the minds of wide awake druggists that our lack of attention to the proper commercial training of apprentices and clerks is one of the main causes of the unsatisfactory condition of the drug business. We take too little pains in properly instructing the beginner in methods of displaying and selling goods. The fact is that many of us haven't the training ourselves, and are consequently unable to impart such information. The average pharmacist is a poor salesman. It is one thing to sell an article called for, but quite another proposition to sell something not called for. This condition is the cause of so much dead stock in many drug-stores. Did we display the same push and energy that a dry goods clerk or a racket store clerk must show in order to hold his job, our sales would quickly increase and less kicks be made about dull times. When selecting an apprentice for your store take such as shows in his daily intercourse with teacher and schoolmates a pleasant and agreeable disposition and a readiness to excel in his classes. If possible select your boy several years before leaving school, and help him to study in the direction of his chosen vocation. When he starts in with you impress upon his mind that order and attention to business will be exacted from him. Lay out his daily work for him, and see that he does it. Be pleasant and yet firm as instructor. Have him locate the various articles in the store as quickly as possible, so that he will be of help to you. Indicate to him how to display goods and push the sale of those of which you have a surplus stock, or those things upon which you make the greatest and best profits. Impress upon his mind that profit is the thing we need to conduct a business satisfactorily. In short, develop early in the boy's life a commercial spirit. This will help him more in securing salary than proficiency behind the prescription case alone. It is time well spent, and will come back to you in increase of business and the thanks of the boy when once he becomes proprietor.

The paper was applauded, and Mr. Cliffe, seconded by Mr. Hopp, moved to refer for publication.

MR. SHERMAN: I think it is a promising sign of the times, indeed, when before this body the question of a commercial education in colleges of pharmacy is taken up. I say it is promising from the fact that the trend of a great deal of the talk we hear from time to time through the journals and at such conventions as this would seem to set the drug man off in a class to himself, as though he was destined to get along without a business or commercial training, and we hear of instances of a business to which the apparently opprobrious epithet of "commercial drug-stores" is applied, as something to be shunned—as though the word "commercialism" were opprobrious. But I would like to ask whether the so-called "commercial drug-stores" are not a pretty good thing, nevertheless? Let the colleges teach commercial and business law, I say; but, better yet, if the apprentice can start in with the sweeping of the drug-store and the washing of bottles, and be a hewer of wood and a carrier of water, it will do just as well to-day as

in Mr. Ebert's time. As a proprietor, I have had considerable experience in employing clerks, and I am very glad to get the college graduate: I recognize the fact that he possesses an advantage that the non-graduate lacks. At the same time, he might be outstripped by the non graduate. The horse that has never been shod with racing shoes and trained every day for a year *may* beat the horse that has been shod and trained; at the same time the horse that has not had the training is at a great disadvantage with the other horse, all other things being equal. I knew a man once, a graduate of one of our best colleges of pharmacy, to fill up a four-ounce bottle for a six-ounce bottle, and when he was confronted with it he said he took the four-ounce bottle out of the six-ounce drawer, and justified his act by the fact that it was in there. He was short on knowledge of the size and physical appearance of a four-ounce bottle—although I have no doubt he could have told you the weight of water in a four-ounce bottle taken at 60 degrees Fahrenheit. The whole of the drug business in a store, from the time you open up in the morning until you close at night, is 100 per cent. If 5 per cent. is "shop-tip," you must know what that is, and if 25 per cent. is commercial work, you must know what that is. Some of these things may be taught in the colleges of pharmacy and some before you get there, and a great deal of it afterwards.

MR. ELIEL: The question of taking an apprentice and instructing him in the way he ought to go is one, of course, of great importance. The young men that we take into our stores to-day are those that become proprietors in the future. They will succeed us when we are laid away with our forefathers, and we cannot be too careful in selecting them. I try to carry out these principles in my store, and I think the methods that I have followed may as well be told here. I will not employ a boy at my soda fountain, even, unless he is at least a seventh or eighth grade scholar. I have none below the eighth grade at the present time, and I have not had for sometime. I start them to work the same as everybody else does, I suppose, sweeping and taking care of the store. and, as Mr. Mittelbach has said, I impress on them the necessity of becoming acquainted with the location of things in the store, and of making themselves useful, telling them that the quicker they locate the things in the store, and the quicker they learn how to get things and wait on customers, the quicker the advance in their wages. I accept no boy unless his parents promise me that after he has been in the store a certain length of time —it is generally not less than two years—that he shall enter some good college of pharmacy and take a full course. I have done this for a number of years, and quite a number of my boys have entered schools of pharmacy under these conditions. In the store, in addition to having them learn all the things that they can learn in connection with practical pharmacy, they are also taught something regarding the care of stock—keeping stock. To each one of the boys is assigned a certain part: one must look after sundries, and see when the stock runs low; another takes care of the things in the basement. The senior clerk has to keep watch on the general stock of chemicals, crude drugs and things of that kind. I train the boys in that part of the business which is so necessary to make a successful pharmacist. I consider the care of stock, and the keeping up of the stock, as one of the most important business features in the drug store. There is nothing that disgusts a customer more than to come into the store two or three times in succession to get an article and be told, We are very sorry, but we haven't got it—just sold the last bottle, but we will have some in a day or two. By training our boys in this way, we have succeeded in making fairly good, competent business men from the druggist's standpoint.

MR. CLAUS: In my experience we have found it hard work to get boys that would wash the windows and sweep out the stores.

MR. ELIEL: I have never had any trouble. My windows are cleaned quite frequently,

sometimes every week. It makes all the difference in the world how you treat your boys. My boys are taught that whatever there is to be done, whoever can do it best shall do it. I wash windows myself when I find it necessary—when the boys are more profitably employed; and I won't ask the boys to do anything that I am not willing to do.

MR. ROEHRIG: The discussion that has taken place reminds me of a little experience I had once. Some years ago, I happened to be stationed at a hospital where I had an assistant who was a physician, and he had been taking care of the pharmaceutical end of it, while I was doing the general hustling around the hospital. He told me that all he wanted to come in there for was to get a little experience in handling medicine, that he wanted to get familiar with drugs; and after about three weeks' experience, he quietly informed me that he knew more about pharmacy than I did. [Laughter.] I said there was no doubt about it, because what I didn't know about it would fill a library. Well, he went away on leave after that—fifteen days' leave—and I had to do all the work. I took down his bottles from the shelves and found out what kind of emulsions he had been making, and I was disgusted. After I had been attending to things for a few days, the Surgeon-General came along and said, "I never saw such prescriptions put up by a pharmacist in the service: how do you do it?" I said I did it in the right way. He said, "I never saw anything done like this." Then he added: "My boy is growing up, and I have often thought I would like him to get into the rudiments of pharmacy, because I would like him to know pharmacy as well as medicine." I said, "Doctor, I would be only too glad to instruct your son, but he must do as I tell him, and not come here two or three hours a day and make a mess of things, and then go out and play ball. He must first learn to wash bottles; that is what I had to do." And my boss would go out and get all the greasy bottles in town and have me wash them—at least I thought so. He replied, "I think you are right." Then I said: "There are other rudiments in this affair: If you will start in and give your boy a copy of Captain Marryatt's book of *Japhet in Search of a Father*, you will find it will be quite interesting to the young man, and he will learn something about what it is to learn the rudiments of a business." Well, after a while my assistant returned, and very soon he came to me and said: "I see you have been playing a little Ph. G. on me in my absence. The 'old man' wants to know why I don't put up prescriptions like yours." I answered, "You told me sometime ago you knew all about pharmacy and were ready to retire: I have only put up my prescriptions the way I was taught." I simply mention these facts to show the ideas some people have about these things. I have had assistants who were apparently afraid to wash a bottle. I have had them come to me since I have been in the Government service, men trained in pharmacy, but with only a few months' experience in the service, and their idea seemed to be that they were officers and had the right to order things around, and they were too dainty to take hold of and clean and use an instrument they should have used, if it happened not to be in order, whereas if they had been properly taught they would, without hesitation, have cleaned out the mortar or graduate, for instance. I know it has been my practice to go through the dispensary, and if I found a Wedgewood mortar, for example, that was not perfectly white, I would have the man whose duty it was to clean it. There is a man usually designated to keep these things in order, and it is only the pharmacist's duty to see that he does it—he can certainly do that much. But when we have been short-handed, I have never yet been above going into the dispensary and scrubbing out a mortar or thoroughly cleaning a graduate. Now, the first impressions made upon a youth upon his entering upon the rudiments of a profession are everlasting, they stay with him, and it is very important that he should be started right. I know I have never been above washing a bottle or cleaning any instrument I was obliged to use in filling a prescription or making a preparation, and it was because I had the right training at the beginning. So I think we should early impress upon our apprentices these things they ought to know.

MR. MCINTYRE: My recollection is, that one of the resolutions referring to the status of persons learning the drug business had a clause saying it was our opinion that such persons should have at least a high-school education. In our city (Philadelphia) we do give a certain amount of commercial education in our College of Pharmacy. The city of Philadelphia has established a commercial high school for girls, but not for the young men. The young men are educated in the high school, and have a course in manual training, but not a commercial course. Now, the question is, Will the future pharmacists of Philadelphia be taken from the commercial high school for girls? [Laughter.]

MR. BURKE: As to the washing of bottles, cleaning of windows and keeping up the stock, these are all important matters, but there is one suggestion that Mr. Mittelbach made in his paper that I want to say a word about, viz., about the inability of the average drug clerk or pharmacist to sell goods not called for. By this I do not mean the ability of the pharmacist to sell some other preparation than that called for, but to demonstrate the advantage of some of his own toilet or medicinal preparations and the great bulk of sick-room supplies, etc., carried in stock. It is surprising how much of this kind of stuff can be sold by the drug clerk who is a real salesman—just as a man sells agricultural implements, by talking up the good points. We had a demonstration in one of our windows of a shoe polish. The polish was shown by one lady and sold by another lady, inside the window in the store. Now the man who sells the shoe polish can sell over 125 bottles a day himself, but he can't find a lady who can sell over 35 bottles. This same thing is true of all apprentices; it is a thing about which they are very ignorant.

The motion to refer Mr. Mittelbach's paper for publication was then put and carried.

The Chair called for the reading of a paper on pharmaceutical progress by Mr. W. H. Burke, of Detroit.

Mr. Burke read his paper as follows, eliciting the applause of his audience:

## PHARMACEUTICAL PROGRESS.

BY W. H. BURKE.

If a vote should be taken as to whether the pharmacist of to-day was in a better position than the pharmacist of a quarter-century ago, I am afraid that the old-time pharmacist would win out, and still the writer does not think that this is so; that is, he believes that the pharmacist of to-day has greater opportunities to secure professional education and a remunerative business than the world ever offered before. Of course, one must admit that there are certain advantages that a new and rapidly-growing community offers to new-comers, but we must also remember that the contestants are not so well equipped with capital and pharmaceutical training. Let us recall some of the ills to which the pharmaceutical body is supposed to have fallen heir.

I think the first place is usually given to the manufacturing pharmacist, because he now makes nearly all of the galenical preparations, the greater part of which were formerly made in the little back room of the erstwhile druggist and apothecary. In looking at any question we should cultivate the practice of placing ourselves in a position to see all sides of the situa-

tion. In this particular case we have the druggists' point of view, and he can see nothing but the fact that the manufacturer is making all the money that he used to make in his back shop.

Then there is the doctor's point of view, and he can see that the product of the manufacturing pharmacist is in no wise inferior to that of the back shop in accuracy, appearance and uniformity. It is known of all men that a person with one thing to do is sure to do it a great deal better than he who has a hundred tasks to perform, and this is why the maker gives second place to the retailer in preparing pharmaceuticals.

It is not at all likely that pharmacists, as a class, would care to go back to the old-fashioned way of gathering, grinding and powdering drugs, and the making of pills, tablets and extracts, if they were to receive only the compensation that the manufacturer does.

The consumer, who by the way receives but scant consideration in these discussions, looks upon these changes with satisfaction, because he gets his prescriptions filled quicker and cheaper than he did in the good old days.

Next to the loss of the profit in making pharmaceuticals, the greatest complaint is about proprietary medicines. This traffic in proprietaries is largely the result of extensive advertising on the part of the makers, and while we all realize that there always has been, and probably always will be, a demand for ready-made preparations to be used for self-medication, we must also recognize the fact that not over 10 or 15 per cent. of the money now spent for the so-called patent medicines would be invested in any kind of medicaments if it were not for the extensive and exaggerated statements of the manufacturers. That this flood of patent medicine literature is largely responsible for the existence of the increased number of drug stores, none can deny, and that the scaling down of prices on these goods has been a hardship on those engaged in the calling is as plain as two and two are four. When the number of dealers in any given community become adjusted to the new condition of things, it leaves what remains in about the same condition as they were before the advent of cut prices. In the greater number of our large cities this shaking down process has been completed, and the only discernible result is that the present day pharmacist is obliged to move a little faster than his predecessor of fifteen or twenty years ago.

We must all admit that there are two successful classes of pharmacists in America to-day, one, the enterprising commercial man, who conducts his business on an energetic and progressive basis, and the other, the professional man, who uses his knowledge and skill in pharmacy, analysis and bacteriological work to draw to him a clientele that give him a very substantial remuneration for his efforts. These two classes are greatly benefited by being able to secure pharmaceutical preparations from the manufacturing laboratories, and thus save time, which they can use to great advantage.

This is opportunity for the energetic and capable, but it is also the slough of despond for the shiftless and unambitious. If the time saved to the pharmacist by modern economic advances is put to good use, he progresses with the rest of the world, but, on the other hand, if he fails to improve this opportunity, it only furnishes him with so many more hours to bewail his lot and to conjure up dismal pictures for the future.

That conditions favorable to the followers of our craft can be encouraged by ourselves is beyond dispute, but before we make progress we must realize what our stumbling-blocks are, and remove them from the path. No one here will deny that better pharmacists mean better pharmacy. We notice that every increase in the requirements for medicine, law, dentistry or pharmacy is quickly followed by an improvement in the accessions to these professions. This seems so simple and so true that it is hard to believe that pharmacists can be found who are unable to see it, and still it is a difficult task to increase the requirements for applicants, who appear before the State boards by means of legal enactments on account of the opposition they meet from pharmacists.

Mr. Koch, seconded by Mr. Hopp, moved that the paper be received and referred for publication. Carried.

The chair asked the Secretary to read a paper on the subject of "Whiskies Bottled in Bond," by B. M. Overton, of Louisville, and the paper was accordingly read.

Mr. Ebert asked if the paper was written by a member of the Association, and Mr. Mittelbach responded that he had the gentleman's application in his hand then—that it had just come in. Mr. Ebert said he doubted the advisability of referring the paper for publication, and that in his opinion whiskey should not be obtained from the drug-store. Mr. Hopp said similar papers had been read before the Ohio and Kentucky Associations.

Upon motion of Mr. Cliffe, seconded by Mr. Wilbert, it was ordered that the paper be referred to the Committee on Publication, with request that they investigate the matter and use their judgment in regard to publishing it.

The following is the text of the paper:

## WHISKIES BOTTLED IN BOND.

BY B. M. OVERTON, LOUISVILLE, KY.

Of all the fields for adulteration, and of all the incentives to adulterate, none offers a more easily accomplished task, nor is the temptation to adulterate more strong, than in that of the whiskey traffic.

Notwithstanding the heavy penalty imposed by the government for such adulteration, there is not a city, town or hamlet in this or any other State in the Union in which this practice is not of daily occurrence.

The question of how to correct this state of affairs is a grave and important one from more than one point of view, and the solution of this problem lies, I believe, in the comparatively recent system of bottling the liquors in bond.

This system absolutely insures to the consumer who will buy an original package of the liquor so bottled immunity from adulteration of any sort, because such package is sealed under government supervision with the internal revenue stamp, which if unbroken is a guarantee that the contents of such package is what the label purports it to be. Think of what this means to those who are in need of whiskey for medicinal purposes.

It is a fact well established through years of investigation by our most learned physicians that whiskey of a mature age and properly made is one of the most valuable remedial agents known to their profession, but how often is it the case that the aim of the physician is defeated by the dispensing of so-called whiskey that in reality is a very dilute alcoholic essence colored and flavored to simulate whiskey, and the patient instead of being benefited is really injured.

Then, too, this system is a protection to the distiller, who by a strict adherence to the rule of manufacturing his whiskey from what he knows to be the purest materials, and by the best methods, has won for his product a reputation for purity and uniformity.

Finally, this system is good, in that it absolutely keeps those who are inclined to be dishonest in the straight and narrow path, and carries out that best of all injunctions, "Lead us not into temptation."

The chair stated that there was a paper that might be read by title, and asked the Secretary to present it.

The paper reported by the Secretary was entitled, "Commercial Courses in Colleges of Pharmacy," by Duncan J. Harbaugh. On motion of Mr. Cliffe, seconded by Mr. Hopp, the paper was ordered referred for publication. The text of the paper here follows:

## COMMERCIAL COURSES IN COLLEGES OF PHARMACY.

BY DUNCAN J. HARBAUGH.

It has occurred to me that a few words on the subject of a commercial course in our colleges of pharmacy might not be amiss. A greater boon to the graduate in pharmacy, I think, could not be found. For how many of us are business men only in as far as our employers' habits, methods and experiences run? And in many cases do we not get an ancient idea of how to keep books and run a store? Up-to-date methods in one's store are imperative in these days of constant advancement, and the pharmacist who does not recognize this fact must surely be pushed to the wall.

Therefore a business course in our colleges means that our clerks are

not only full of pharmacy, chemistry and materia medica, but that they are also full of ideas that may benefit your store. I say may, because we all know, too, that at times a young man's ideas run beyond the ordinary scope of a drug store. His ideas of improvement may be beyond the limit of his employer's pocketbook. But at least he knows, after a business course such as is given, for instance, in *one* of our colleges of pharmacy, the responsibilities of a business life, and he enters upon his life's work knowing that, to live, he may not bury his talent in a napkin, but that he must turn it over and over again.

That it is just as essential for a clerk to know how to write and indorse checks, to fill up a promissory note and know what is meant by "title insurance," I think you will all agree. And how are our clerks to learn this if not at their college? For many a boy must start in to wash bottles and learn the drug business because his parents cannot afford to send him to school or have him idle.

It is one of the greatest benefits possible to our clerks, and to ourselves through our clerks. Let us hail the introduction of it in our colleges, and lend all our efforts to putting it in every college of pharmacy in the United States. And I trust that, should any instructors in our colleges of pharmacy throughout the country hear or see this, they may think it worthy of consideration for the sake of our coming druggists.

The Chairman stated that the time had now come for making nominations for officers of the Section for the ensuing year, and called for nominations for Chairman.

Mr. Ebert nominated Mr. W. C. Anderson, of New York, and Mr. Eliel seconded the motion, but Mr. Anderson insisted that he must decline to accept the position, and the chair called for other nominations.

Mr. Meissner then put in nomination the name of Mr. William Mittelbach, of Missouri, but Mr. Mittelbach also begged to decline, saying that he had his hands too full to attend to the duties of the office—that he was willing, but not able.

Mr. Mayo then nominated Mr. W. L. Dewoody, of Pine Bluff, Ark., for Chairman, and Mr. Thos. P. Cook seconded the nomination.

On motion of Mr. Anderson, it was ordered that nominations for Chairman be closed. Mr. Hallberg then moved that the Secretary of the Section cast the affirmative vote of the Section for Mr. W. L. Dewoody as Chairman, which motion carried. The Secretary announced that he had cast the ballot as directed, and the chair declared Mr. Dewoody duly elected Chairman of the Section on Commercial Interests for the ensuing year.

The chair called for nominations for Secretary, and Mr. Claus nominated Mr. R. C. Reilly, of St. Louis. Mr. Hopp seconded the nomination. Mr. Eberle moved that the Secretary be instructed to cast the ballot

of the Section for Mr. Reilly for Secretary for the ensuing year, and the motion prevailed. The Secretary announced that he had cast the ballot as directed, and the chair declared Mr. Reilly duly elected to the office named.

The Chair called for nominations for three Associate Members of the Committee on Commercial Interests. Mr. Ebert nominated Mr. Chas. R. Sherman, of Omaha; Mr. Hopp nominated Mr. Chas. R. Roth, of Canton, Ohio; and Mr. Hallberg nominated Mr. Edwin M. Boring, of Philadelphia. Nominations were ordered closed, and Mr. Cliffe moved that the Secretary be instructed to cast the ballot of the Section for the three gentlemen named as Associate Members of the Committee. The motion carried, and the Secretary stated that he had cast the ballot as directed, and the Chair declared the gentlemen duly elected.

The Chair appointed Mr. Koch and Mr. Hopp a committee to escort the newly elected Secretary to the rostrum, stating that the newly elected Chairman was not present. This committee was also requested to escort the new associate members forward. The gentlemen thereupon conducted Mr. Riley, Mr. Sherman and Mr. Boring to the platform, Mr. Roth, of the committee, not being present. Mr. Koch, of the escort committee, introduced Mr. Riley as the new Secretary of the Section, and he was greeted with applause. The Chair introduced Mr. Sherman and Mr. Boring as two of the new Associate Members, and said the Section was glad to have them accept these positions.

The Chair then asked if there was any further business to come before the Section, and there being none, on motion of Mr. Puckner, the Section stood adjourned.

# MINUTES

OF THE

# SECTION ON SCIENTIFIC PAPERS.

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FIRST SESSION—WEDNESDAY MORNING, AUGUST 5, 1903.

The first session of the Section on Scientific Papers was called to order by Chairman Schlotterbeck at 10 : 10 a. m., in the Casino of the hotel.

The Chairman announced that the Secretary of the Section, Mr. Joseph W. England, of Philadelphia, was not present, and that Mr. Edward Kremers had consented to act in that capacity. He also stated that the Associate Member of the Committee, Mr. Francis Hemm, of St. Louis, was absent, and that he would ask Mr. W. A. Puckner to act in his place.

Mr. Puckner was then called to the chair while the chairman read the following address :

*Gentlemen :* The By-Laws of this Association instruct the Chairman to prepare a short address upon subjects connected with this section. Therefore I shall not attempt a survey of all the achievements in our sciences which have been accomplished during the past year, but will confine myself to investigations upon the mydriatic alkaloids, atropine and hyoscyamine, which have been recently completed. In prefacing my remarks you will pardon me for repeating very familiar chemical history.

A little over fifty years ago Pasteur, while working upon racemic acid, published his classic researches upon the relations that may exist between crystalline form, chemical composition and optical activity. Briefly stated, by making a double sodium ammonium salt of racemic acid and crystallizing below 28° C., he obtained large rhombic crystals, part of which possessed right hemihedral faces, and part left hemihedral faces. In other words, one crystalline form was an exact mirror picture of the other. By isolating these two forms mechanically and decomposing them separately, he obtained two tartaric acids of identical composition, of which the one with right hemihedral faces turned the plane of polarized light the same number of degrees to the right as the one with the left hemihedral faces turned it to the left. By combining solutions of equal quantities of these two optically active acids he regenerated racemic acid, which is optically inactive. The same results were nicely accomplished by means of the alkaloids cinchonine and quinicine. When racemate of cinchonine was allowed to crystallize from its solution Pasteur noticed that the salt of l-tartaric acid separated out first, while the salt of the d-acid remained in solution. In the case of quinicine racemate the opposite results were ob-

served, viz., the salt of d-tartaric acid separated first. Further, by inoculating a solution of the acid ammonium salt of racemic acid with the fungus Penicillium glaucum, the salt of d-tartaric acid was selected for destruction, leaving the salt of l-acid in solution.

Since these isomeric substances differ from each other principally in their physical properties they first received the name physical isomers. Later this term was supplanted by the more appropriate terms, geometrical or stereo-isomers.

Pasteur and others attempted to explain the phenomena of stereo-isomerism by a difference in the arrangement of the atoms of a compound in space; but they were at a loss to know just how these atoms or groups were to be placed. In 1874 two investigators, Le Bel and van't Hofft, working independently, ascribed optical activity and the isomerism of optically active carbon compounds to the presence in the molecule of one or more asymetric carbon atoms, *i. e.*, carbon atoms that are linked with four atoms or groups all differing from each other. While this theory was received with hesitation and much opposition at first it can be safely said that not a single optically active carbon compound is known which does not bear out this hypothesis. Not all compounds containing asymetric carbon atoms, however, are optically active.

Among the stereo-isomeric carbon compounds none are of greater interest or importance than some of the plant alkaloids. Thanks to investigations which have been completed during the past year both in Europe and America there is now absolute proof that the alkaloids atropine and hyoscyamine are stereo isomers and that the former is the racemic form of the latter.

Ladenburg long ago proved that these two alkaloids are isomers with the formula $C_{17}H_{23}NO_3$. The optical activity of hyoscyamine was recognized by a number of investigators at about the same time, but the exact rotation $[a]_D = -21.8^{\circ}$ was first determined by Ladenburg. In the case of atropine there was much discussion regarding its behavior toward polarized light, owing to the difficulty of isolating it in a perfectly pure state. Not until within comparatively recent years has the optical inactivity of atropine been universally accepted as a fact.

In an elaborate series of researches upon the constitution of these alkaloids Ladenburg showed that they were both tropic acid esters of the base tropine, *i. e.*, he succeeded in splitting them both into tropine and tropic acid by means of saponification. This, together with the well-known fact that hyoscyamine is most easily converted into atropine, led to the conclusion that atropine is the racemic form of hyoscyamine, though some proofs were still wanting. This, of course, implies the existence of the complement of ordinary or l-hyoscyamine, viz., d-hyoscyamine, but this had never been isolated or prepared. Ladenburg made many attempts to resolve atropine into its optically active components, along the line of Pasteur's work, but only partially succeeded, inasmuch as he obtained what he called a right atropine, which must have been, in the light of our recent knowledge, a mixture of atropine and d-hyoscyamine. Up to six months ago there was no evidence in literature of the existence of such a compound as d-hyoscyamine.

It was at this time that an interesting and important pharmaceutical investigation, bearing directly upon this subject, was being pursued by Dr. Cushny, of the University of Michigan. Clinical and laboratory reports upon the action of these two bases in the body are not wanting, but they are so conflicting and so widely at variance with each other that no reliance can be placed upon them. Some reported hyoscyamine as inert, others that its action is identical with atropine, while still others claimed that their actions were widely different. It is very evident that some of these operators were working either upon mixtures of alkaloids or with saponification products. Therefore when atropine and hyoscyamine of undoubted authenticity and purity were prepared in the course of an investigation upon the alkaloids of scopola and belladonna, the opportunity for a scientific comparative pharmacological study of these bases was eagerly embraced

and the necessary material placed at the disposal of Dr. Cushny. I have followed the progress of his investigation with great interest, and can say that the results obtained are no less remarkable than the care, skill and accuracy bestowed upon the work. The study has extended over more than a year's time, and the results, which are very briefly summarized here, will be given in detail in an article that is now on press.

I. Upon the central nervous system of mammals, atropine acts exactly like hyocyamine, both in the nature and in the intensity of action. It also acts like hyoscyamine upon the heart and the terminations of the motor nerves in the frog.

Assuming that atropine consists of equal parts of l-hyoscyamine and the hypothetical d-hyoscyamine, it follows from these results that the latter alkaloid will have the same action upon these organs and upon these animals as atropine and l-hyoscyamine.

II. Atropine acts more powerfully upon the reflexes of the spinal cord in the frog than l-hyoscyamine.

Using the same line of argument this indicates that d-hyoscyamine has a more powerful action upon the spinal cord of the frog than its complement l-hyoscyamine.

III. l-Hyoscyamine is twice as powerful as atropine upon the nerve ends of the salivary glands, heart and pupil in mammals. This means that the unknown d-hyoscyamine, when found, will show little or no action upon these nerve ends.

The argument is made that if atropine is really the racemic form of ordinary hyoscyamine then a d-form must exist, and that the pharmacological action of atropine is the sum total of the actions of its optically active modifications, since it is probable that when atropine goes into solution it does not exist as such but as a simple mixture of d- and l-hyoscyamine.

These deductions had been arrived at scarcely a fortnight when the excellent and highly important article upon the conversion of atropine into d- and l-hyoscyamine by Amenomiya appeared. A resumé of this magnificent research which was only accomplished after many failures may not be without interest.

Nearly pure atropine of the market, rotating $[a]_D = -1.39°$ was saponified by boiling with water under reflux condenser for about 24 hours. The reaction product was reduced to small volume, strongly acidified with $H_2SO_4$ to hold the base tropine in solution, and repeatedly shaken out with ether. This removed mainly tropic acid.

The acid aqueous liquid remaining was carefully neutralized, concentrated to small volume, mixed with powdered CaO and anhydrous $CaSO_4$, dried and extracted with ether. Upon evaporation of the ether, tropine was left as a white crystalline residue.

The r-tropic acid, which was first obtained, was split into its active components d- and l-tropic acids in a manner similar to that employed by Pasteur in the splitting of racemic acid. The quinine salt of r-tropic acid was prepared and from the solution, upon concentrating, the d-tropate of quinine separated first leaving the l-tropate in solution. The latter was recovered from the mother liquor after concentrating. From these two salts the respective d- and l-acids were easily obtained by decomposing with stronger acids, and then purified. Prepared in this manner the d-tropic acid rotated $[a]_D = +71.30°$ and the l-tropic acid $[a]_D = -72.75°$.

Since Gadamer showed that the cause of optical inactivity of atropine and the activity of hyoscyamine resided in the tropic acid nucleus, and not in the tropine, it appeared natural that d-hyoscyamine could be prepared by coupling d-tropic acid with tropine. This was in fact accomplished by mixing nearly equal quantities of tropine and d-tropic acid with 25 to 35 volumes of 5 per cent. HCl, and evaporating to about 3 volumes. The solution was made alkaline and repeatedly shaken out with ether, which took out principally the new base which has so long been sought. Purification was effected by means of the gold salt, decomposing with $H_2S$, and crystallizing. The synthesis of l-hyoscyamine was accomplished in the same manner by using the l-tropic acid instead. As to the success of this research it need only be said that a d-hyoscyamine was obtained, which rotated $[a]_D = +23.15°$, and a l-hyoscyamine which rotated $[a]_D = -24.12°$.

Now that the preparation of d-hyoscyamine had been accomplished, Dr. Cushny was naturally very anxious to verify his predictions regarding its physiological actions, and accordingly made a request for some of the new base. Through the kindness of Prof. Gadamer, under whose direction this admirable piece of work was conducted, 0.050 Gm. were placed at his disposal. No experiments could be made upon the central nervous system of mammals, or upon the heart and terminations of motor nerves of the frog, because of the small amount of material. In all the tests which he made, his expectations were fully realized, since he found, first, that d hyoscyamine, as predicted, has a much more powerful action upon the spinal cord of the frog than l-hyoscyamine; and, second, that it is only $\frac{1}{15}$ to $\frac{1}{6}$ as powerful as l-hyoscyamine upon the nerve terminations in the salivary glands, heart and pupil of mammals, or nearly inert.

These positive results have suggested several interesting questions. One of these has reference to the existence of these products in the living plant. It has been held by Will and others that l-hyoscyamine is the parent of atropine. If the hypothesis that atropine when brought into solution exists, not as such, but as a mixture of its optically active modifications, then there is a possibility that d-hyoscyamine is associated with l-hyoscyamine in the plant juices, and that the racemic form atropine is not formed until the drug is dried.

Do not these researches shed light upon the discrepancy noted in recent reports upon the action of hyoscyamine in which it was claimed that C. P. hyoscyamine, Merck, was found to be physiologically inert? There is a possibility that these investigators were working with either d-hyoscyamine, or perhaps with the saponification product of atropine or hyoscyamine, viz., tropine.

The full report of Dr. Cushny shows that the action of atropine and l-hyoscyamine is in the same direction, but with different intensity, upon certain organs. Therefore, could not these alkaloids be used one for the other, it being only a matter of dosage, which is always regulated by the physician?

In conclusion, I wish to thank most heartily the members of this Association for the generous manner in which they have responded to the call for contributions. The majority of the papers represent long, patient and faithful work in the laboratory, and redound alike to the credit of the Association and the authors.

Mr. Schlotterbeck's address as chairman was greeted with applause.

On motion of Mr. Rusby, the address was ordered received and referred to a special committee of three, to be appointed by the temporary chairman, for action and report, and the Chair appointed Mr. Lyman F. Kebler, of Washington City; Mr. Julius A. Koch, of Pittsburg, and Mr. H. Kahn, of Chicago, as such committee.

Mr. Schlotterbeck resumed the chair.

The Chair announced that the next order of business was the reports of committees, and called on Mr. J. A. Koch, as chairman of the Committee on the Ebert prize, who submitted the following report for that committee:

*To the Members of the Scientific Section of the American Pharmaceutical Association:*

*Gentlemen:* The committee appointed to award the Ebert Prize, after a careful consideration of the papers presented at the meeting of the Association in 1892, have awarded the prize to Dr. Frederick B. Power, of London, for his exhaustive paper on "The Chemistry of the Stem of Derris Uliginosa."

Respectfully submitted,

J. A. KOCH, *Chairman.*
WM. K. ILHARDT,
H. V. ARNY.

THE CHAIRMAN: Gentlemen, you have heard the report of the chairman of the Committee on Ebert Prize. What is you pleasure?

Mr. Mayo, seconded by Mr. Kennedy, moved to adopt, and the motion prevailed.

The Chair called for the report of the Committee on Drug Adulterations, Mr. E. L. Patch, chairman. Mr. Patch was not present, and Mr. E. H. Gane, of the committee, was asked to read the report, which he did.

## REPORT OF COMMITTEE ON DRUG ADULTERATIONS.

The earnest effort of your committee to enlist the active co-operation of our membership has not been as fruitful of results as we could wish. We had hoped that our suggestion that any variation in standard coming to the attention of any member of the Association should be at once reported to the committee, might result in securing reports covering the entire country and prove of great value; but so far we have been largely dependent upon the personal efforts of the committee.

Shortly after our appointment, we interviewed the drug appraisers of Boston, New York and Philadelphia and were assured of their willingness to co-operate with your committee as far as possible. They were of the opinion that a knowledge of the strictness of inspection prevented the attempt to enter very inferior drugs. Those most carefully examined are: lupulin, opium, ipecac, jalap, guaiac resin and asafetida. In 1902 one lot of rhubard and one case of chemicals were rejected at the port of New York.

Recently we noticed the offer for sale in the London market of forty cases of asafetida rejected at the U. S. ports.

Your committee have given attention to several subjects that will be considered in special papers to be presented to the Scientific Section.

A range of 250 per cent. in the price of aloins and the great difference in their physical appearance and properties, calls for investigation. This will be undertaken by Mr. Havenhill and the results presented at a future meeting.

The condition of the cod-liver oil market had led to the development of unusual interest in this product. Before the recent phenomenal advance in the price of Norwegian oil, it was stated that certain dealers were offering shore oil and mixtures of shore oil and Norwegian oil in containers similar to those employed for marketing Norwegian oil and selling the product as "pure Norwegian oil."

Your committee would have been glad to secure the help of those analysts who give certificates that oils they have separated from emulsions by solvents, altered as they are by the process of extraction, test as pure Norwegian oil; but up to date we have received no light upon the method employed. The test most depended upon is that with fuming nitric acid. Bedall asserts that it is not conclusive. A fresh, pure oil will give the rose-color at once, while the same oil a year old fails to respond to the test.

Substitutes for cod-liver oil are now being freely offered in the New York market. The basis of all these is a specially refined seal oil, and in some instances pure seal oil is offered for "mixing" with Norwegian oil. A "fish-liver oil" is also being offered in the London market as a substitute. (See C. & D., July 4, 1903.)

Mr. E. H. Gane, of our committee, will present to the Scientific section a paper on "Cod-Liver Oil and its Adulterants."

Examination of numerous samples of essential oils shows that gross adulteration is being practiced with oils intended for the use of the retail trade. In some instances artificial mixtures are supplied in place of the natural products.

Your committee have had the assistance of the new drug laboratory at Washington, and Lyman F. Kebler, chief, will present to the Scientific Section at this meeting a paper upon the sophistication of drugs.

Professor V. Coblentz, in his address as chairman of the New York Section of the Society of Chemical Industry, treated the matter of adulteration at some length, and submitted samples of drugs that were spurious or largely adulterated.

Your committee suggests the passage of a resolution directing that these samples, and all others of adulterated products presented as exhibits of the various reports of this committee, after examination by the members present at the meeting, be forwarded to the drug laboratory at Washington, to form the nucleus of a permanent collection for future reference.

Your Committee understand that arrangements have been made with the Bureau of Plant Industry, Rodney H. True, Physiologist, to care for all specimens so presented.

In connection with this report we submit an outline of standards referred to in the revised statutes of the United States.

Your attention is directed to the report of the Committee on Inspection, Complaints and Prosecutions of the Board of Pharmacy of New York State. The Committee has inspected 1,372 stores, has made 278 prosecutions with 106 convictions, 5 acquittals and 167 suits pending. 314 samples examined showed 188 to be standard, or nearly so, and 126 deficient.

Attention is also called to the complaints made by physicians in papers read at the meetings of the different medical associations. upon the great variation in the appearance and activity of the prescriptions, due to the wide range of alcoholic strength of the solvents employed, and the extensive variation in the character of the drugs used.

Examination of the market so-called resinoids or concentrations, brings to light a variation of 233 per cent. in their alcohol soluble constituents, and proves that many are not as strong as the extracts and powdered extracts made from the same drug by other houses.

Examination of the market fluid extracts and elixirs demonstrates that as great a difference in composition may be proven.

Whether our Assaciation can exert any influence in the line of greater uniformity, is a question for your consideration.

In the report of Prof. Coblentz, previously referred to, attention is directed to the divergent results in the assay of the same drug by *experienced* chemists: aconite root, 0.5 per cent. to 0.98 per cent.; conium. 0.52 per cent. to 0.97 per cent.; calabar, 0.07 per cent. to 0.14 per cent.; belladonna root, 0.40 per cent. to 0.51 per cent.; belladonna leaf, 0.14 per cent. to 0.20 per cent.; hydrastis, 2.74 per cent. to 3.54 per cent.; ipecac, 1.74 per cent. to 2.23 per cent.; guarana, 0.74 per cent. to 3.84 per cent, and 2.48 per cent. to 4.68 per cent.

These differences may be due to different processes, to different degrees of purity in the weighed product in gravimetric methods, to failure to use neutral alcohol or properly standardized solutions in volumetric methods, or to error in calculation.

Nevertheless, if such results are obtained by *experienced* chemists, it is very apparent that any process of assay adopted by the Pharmacopœia should be given in complete detail and hedged about by all proper precautions, without assuming too much knowledge on the part of the purchaser of the volume.

It would be helpful if the new drug laboratory could be used as a medium of investigation and interchange of results with the *same* sample of drug, until greater uniformity shall be secured.

Your committee recommend the adoption of the following resolutions by the Association:

*Resolved*, That it is the sense of the American Pharmaceutical Association that great good would be accomplished if the Secretary of the Treasury would confer with the Secretary of Agriculture for the purpose of making suitable arrrngements with all the United States port chemists to place at the disposal of the Bureau of Chemistry all their analytical methods bearing on drugs and chemicals and the data they obtain in the examination of imported goods from time to time.

*Resolved*, That the interests of medicine and pharmacy would be advanced by the appointment, under the direction of the Association of Official Agricultural Chemists, of a referee on medicinal plants and chemicals.

Respectfully submitted,

EDGAR L. PATCH,
EUSTACE H. GANE,
L. D. HAVENHILL,
LYMAN F. KEBLER,
A. B. LYONS,
*Committee on Drug Adulterations.*

## REVISED STATUTES OF THE UNITED STATES.

SECOND EDITION, 1878.

*Referring to the Examination of Drugs, Medicines, etc., at the Ports of Entry.*

SEC. 2933. All drugs, medicines, medicinal preparations, including medicinal essential oils and chemical preparations, used wholly or in part as medicine, imported from abroad, shall, before passing the custom house, be examined and appraised, as well in reference to their quality, purity and fitness for medical purposes as to their value and identity specified in the invoice.

SEC. 2934. All medicinal preparations, whether chemical or otherwise, usually imported with the name of the manufacturer, shall have the true name of the manufacturer and the place where they are prepared permanently and legibly affixed to each parcel by stamp, label or otherwise; and all medicinal preparations imported without such names so affixed shall be adjudged to be forfeited.

SEC. 2935. If, on examination, any drugs, medicines, medicinal preparations, whether chemical or otherwise, including medicinal essential oils, are found, in the opinion of the examiner, to be so adulterated, or in any manner deteriorated, as to render them inferior in strength and purity to the standard established by the United States, Edinburgh, London, French and German Pharmacopœias and dispensatories, and thereby improper, unsafe, or dangerous to be used for medicinal purposes, a return to that effect shall be made upon the invoice, and the articles so noted shall not pass the custom house unless, on a re-examination of a strictly analytical character, called for by the owner or consignee, the return of the examiner shall be found erroneous, and it is declared, as the result of such analysis, that the articles may properly, safely and without danger be used for medicinal purposes.

SEC. 2936. The owner or consignee shall at all times, when dissatisfied with the examiner's return, have the privilege of calling, at his own expense, for a re-examination; and the collector, upon receiving a deposit of such sum as he may deem sufficient to defray such expense, shall procure some competent analytical chemist possessing the confidence of the medical profession, as well as of the college of medicine and pharmacy, if any such institutions exist in the State in which the collection district is situated, (to make) a careful analysis of the articles included in the return, and a report of the same, under oath. In case this report, which shall be final, shall declare the return of the examiner to be erroneous, and the articles to be of the requisite strength and purity, according to the standard referred to in the next preceding section, the entire invoice shall be passed without reservation on payment of the customary dues.

SEC. 2937. If the examiner's return, however, shall be sustained by the analysis and report, the articles shall remain in charge of the collector, and the owner or consignee, on payment of the charge of storage and other expenses necessarily incurred by the United States, and on giving a bond, with sureties satisfactory to the collector, to land the articles out of the limits of the United States, shall have the privilege of re-exporting them at any time within the period of six months after the report of the analysis; if the articles shall not be sent out of the United States within the time specified, the collecter, at the expiration of that time, shall cause the same to be destroyed, and hold

the owner or consignee responsible to the United States for the payment of all charges, in the same manner as if the articles had been re-exported.

SEC. 2938. One of the assistant appraisers at the port of New York, to be appointed with special reference to his qualifications for such duties, shall, in addition to the duties that may be required of him by the appraiser, perform the duties of a special examiner of drugs, medicines, chemicals, and so forth.

SEC. 2939. The collector of the port of New York shall not, under any circumstances, direct to be sent for examination and appraisement less than one package of every invoice, and one package at least out of every ten packages of merchandise, and a greater number, should he or the appraiser, or any assistant appraiser, deem it necessary. When the Secretary of the Treasury, however, from the character and description of the merchandise, may be of the opinion that the examination of a less proportion of packages will amply protect the revenue, he may, by special regulation, direct a less number of packages to be examined.

## RESULTS OF EXAMINATIONS.

| *Name.* | *Impurity.* | *Reporter.* |
|---|---|---|
| Acid, Hydrochloric, C. P. | 3 carboys. All gave zinc. Apparently from zinc cap of carelessly-closed carboys. | E. L. Patch. |
| Acid, Hypophosphorous, 50 per cent. | Under strength. Contained excess of metallic impurities and calcium sulphate. | E. L. Patch. |
| Alum, Dried. | Eight samples proved to be made from ammonia alum. None found made from U. S. P. potassium alum. | E. L. Patch. |
| Ammonium Chloride, Pure. | Not all volatilized. Gives ppt. with ammonium sulphide and potassium ferrocyanide. Contains aluminum salt. | E. L. Patch. |
| Aristol. | 25 samples did not contain a trace of aristol. Journ. Society Chem. Industry, Jan., 1903, V. Coblentz. | E. L. Patch. |
| Arrowroot. | Substituted entirely by cornstarch. British Food Journal, 1902, 4, 204. | L. F. Kebler. |
| Arrowroot, American. | 75 per cent. cornstarch. | E. H. Gane. |
| Beeswax (1). | Abnormal in all respects. Sp. gr., 0.9418; melting point, 61° C.; acid number, 11.06; ether number, 54.44. Contained 30 per cent. paraffin. | L. F. Kebler. |
| Beeswax (2). | A mixture of beeswax and Chinese wax. | E. H. Gane. |
| Beeswax (3). | Adulterated with 33 per cent. of cassava starch. Freed from the starch the residual wax tested as pure. | L. F. Kebler. |
| Cannabis Indica, No. 1. | 19 per cent. below standard. | E. L. Patch. |
| Cannabis Indica, No. 2. | 24 per cent. below standard. | E. L. Patch. |
| Cantharides, Russian Powdered. | Low in cantharidin, 0.38, 0.36. Is often 0.8. | E. L. Patch. |
| Carbon Bisulphide, C. P. | Contained 0.3 per cent. dissolved sulphur, colored lead acetate solution and had fetid odor. | L. F. Kebler. |
| Chloroform, Pure for Anæsthesia. | Rarely stands the barium hydrate test, and from careless storage or handling is not fit for anæsthetic purposes. Three samples contained decomposition products— $COCl_2$ and HCl. | E. H. Gane. |

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| Coca Leaf. | Contained 18 per cent. twigs, stems, seed capsules, foreign leaves, etc. | L. F. Kebler. |
| Cochineal. | Contained 30.81 per cent. ash instead of 6 per cent. Impurity was talcum. | L. F. Kebler. |
| Cochineal, Powd. | Contained 17.25 per cent. ash, largely earthy matter. | L. F. Kebler. |
| Colocynth, Trieste. | Contained 50 per cent. loose seed in addition to those in the fruit. 5 cases gave 45 per cent. pulp. | E. L. Patch. |
| Colocynth, Spanish. | Contained 75 per cent. loose seed. Hard to obtain with less than 40 per cent. loose seed. 5 cases gave 20 per cent. pulp. | E. L. Patch. |
| Copaiba. | Mixed with fatty oil and of pungent rancid odor. | E. H. Gane. |
| Cottonroot Bark. | Nearly half of bale, rootlets and not bark. | E. L. Patch. |
| Creosote, Beechwood. | Contained but a trace of the portion on boiling around 205° C. to 210° C., showing removal of guaiacol. | E. H. Gane. |
| Cubeb Berries. | Contained 25 per cent. of twigs, stems, worthless berries, etc., yielded 6 per cent. oil. The admixture of genuine but worthless material far from uncommon. | L. F. Kebler. |
| Diastase of Malt, No. 1. | 1 part converted 30 of starch. | E. L. Patch. |
| Diastase of Malt, No. 2. | 1 part converted 100 of starch. | E. L. Patch. |
| Eucalyptol. | Sp. gr. 0.9272; optical rotation $+1° 30'$. Should be inactive. Boiling point, 174° to 175° C. Seldom met with a sample complying strictly with U. S. P. requirements. | L. F. Kebler. |
| Gamboge, Powdered. | Contained a notable amount of starch. Apparently rice flour. | E. L. Patch. |
| Gamboge, Powdered. | Frequently mixed with starch. | E. H. Gane. |
| Goldenseal. | Contained 23.8 per cent. ash and 2.02 per cent. hydrastine alkaloid. The admixture of foreign matter either by accident or design is far too prevalent. | L. F. Kebler. |
| Horse Medley. | Supposed to be crude antimony sulphide. Contained 99 per cent. wood charcoal. | E. H. Gane. |
| Iodine, Soluble. (1 drop represents 15 grains of potassium iodide.) | Consists of 2 G. iodine in 100 Cc. of alcohol. | E. L. Patch. |
| Jaborandi, Leaf. | Contained 16.7 per cent. of sticks, stems and other foreign matter. | L. F. Kebler. |
| Jaborandi, Fl. Ext. | Contained 0.32 per cent alkaloid. Standard, 0.75 per cent. | E. H. Gane. |
| Linseed Meal. | Carload lot. Oil had been removed. Only 18 per cent. remained. | L. F. Kebler. |
| Lithium Carbonate. | Contains 98.25 per cent. lithium carbonate and slight excess sulphate. (U. S. P. requirement, 99 per cent. lithium carbonate.) | E. L. Patch. |

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| Lycopodium. | 2 lots contain small percentage of starch. Gave 2 per cent. ash, which is below the U. S. P. limit of 5 per cent. | E. L. Patch. |
| Mace. | Adulterated with Malabar mace, ingeniously colored to resemble the genuine. Microscopical sections differ little from the genuine product. Chemist & Druggist, 1902, 61, 1002. | L. F. Kebler. |
| Mercurial Ointment. | Did not contain any mercury. British Food Journal, 1902, 4–185. | L. F. Kebler. |
| Mustard Flour. | Contained 47 per cent. of wheat starch, colored with turmeric. British Food Journal, 1902, 4, 165. | L. F. Kebler. |
| Oil Almond, French. | Supposed to be expressed from peach kernels. Consists wholly or in part of peanut oil. | E. H. Gane. |
| Oil Bay. | Sp. gr. too low. 0.9427. | L. F. Kebler. |
| Oil Bay. | Sp. gr. too low. 0.9460. Should be 0.965 to 0.975 U. S. P. | E. L. Parch. |
| Oil Caraway. | Prepared by admixture of carvene and carvol in varying proportions. | E. H. Gane. |
| Oil Cedar. | Abormal in all points. Sp. gr. 0.8857. Optical rotation —1° 55′. Insoluble in ten volumes of 80 per cent. alcohol. The quality of Oil Cedar seems to be abnormally bad. | L. F. Kebler. |
| Oil Citronella (1). | Adulterated with resin spirit. Chemist & Druggist, 1900, 62, page 458. | E. H. Gane. |
| Oil Citronella (2). | Adulterated with kerosene—very common. | E. H. Gane. |
| Oil Cod Liver (1). | Mixed with Seal Oil. | E. H. Gane. |
| Oil Cod Liver (2). (Norwegian.) | Mixed with coast or shore oil, or substituted by it. | E. H. Gane. |
| Oil Hemlock, No. 1. | Sp. gr. 0.8758. Optical rotation, + 2° 40′. Should be—Sp. gr. 0.907 to 0.913, and optical rotation —20° to 24°. | |
| Oil Hemlock, No. 2. | Sp. gr., 0.9001. Optical rotation, —9° 36′. Contains 13 per cent. of bornyl acetate. | L. F. Kebler. |
| Oil Lavender, No. 1. | Contains Salicylic Acid. Journ. Am. Chem. Soc., 24, 1027. | L. F. Kebler. |
| Oil Lavender, No. 2. | Contained oil of turpentine. | E. H. Gane. |
| Oil Lemongrass. | Mixed with Acetone. Chemist & Drug., 1903, vol. 62, page 768. | E. H. Gane. |
| Oil Limes, Expressed. | Rank odor. Optical rotation, 11° 48′. Should be 35° to 38°. Solubility abnormal. Corresponds to a distilled oil. | L. F. Kebler. |
| Oil Olive (1). | Substituted by paraffin oil. British Food Journal, 1902, 4, 203. | L. F. Kebler |
| Oil Olive (2). | A large portion of the cheaper grades is adulterated. Admixtures with cottonseed oil are less frequent, but the use of peanut oil is very common. | E. H. Gane. |

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| Oil Peppermint. | Mixed with Acetin. Chemist & Druggist, April 11, 1903, 591. | E. H. Gane. |
| | The addition of Acetin raises the apparent content of ester. | L. F. Kebler. |
| Oil Rue, No. 1. | Abnormal in every point. Sp. gr., 0.855. Optical rotation, —30.72. Insoluble in 70 per cent. alcohol. Does not congeal at —10° C. 80 per cent. distills 160° to 200° C. Adult. French Oil Turpentine. | L. F. Kebler. |
| Oil Rue, No. 2. | Abnormal in every point. Optical rotation, —27.65°. 85 per cent. distilled between 160° and 200° C. Adulterant French Oil Turpentine. | L. F. Kebler. |
| Oil Rue. | Both samples reported adulterated. | E. H. Gane.<br>E. L. Patch. |
| Oil Sandalwood (1). | Mixed with Cedar Oil. | E. H. Gane. |
| Oil Sandalwood (2). | Adulterated with Chloroform, raising the sp. gr. and increasing the apparent contents of alcohol. | L. F. Kebler. |
| Oil Sassafras, No. 1. | Sp. gr., 1.024. Should be 1.07 to 1.09. Contained Oil of Camphor. | E. L. Patch. |
| Oil Sassafras, No. 2. | Sp. gr., 1.048. Contained Oil of Camphor. | E. L. Patch. |
| Oil Turpentine, Rectified. | Sp. gr., .8600. Gave 2 per cent. of resin. Should be free from resin. | E. L. Patch. |
| Pepper, Black. | One sample contained 70 per cent. ground rice, and another 18½ per cent. organic matter. Br. Food Journal, 4, 92, 139. | L. F. Kebler. |
| Petroleum Ether. Boiling point 60° to 65° C. | Not obtainable. The commercial article boils anywhere from 30° to 120° C., owing to the cracking of hydrocarbons during distillation. | E. H. Gane. |
| Phenacetin. | Claim made that 315 samples consisted largely of acetanilid. N. Y. Board of Health. Drug Circular, Feb., 1903. | E. L. Patch. |
| Podophyllin. | Commercial grades rarely range over 85 per cent. soluble in alcohol. Apparently little effort is made to remove all extractive matter. Some samples are apparently powdered alcoholic extracts. | E. H. Gane. |
| Podophyllin. | Picropodophyllin content (Gordin's method). No. 1, 17 per cent.; No. 2, 14.4 per cent. Standard, 22 per cent. | E. H. Gane. |
| Potassium Bromide, No. 1. | Contained notable amount of bromate. | E. L. Patch. |
| Potassium Bromide, No. 2. | American brands contain 1 per cent. to 9 per cent. chlorides; rarely less than 3 per cent. German brands are better, usually containing 1 per cent. to 2 per cent. | E. H. Gane. |
| Potassium Bisulphate, C. P., No. 1. | Contained 88.78 per cent. potassium bisulphate. Remainder sulphate and moisture. | L. F. Kebler. |
| Potassium Bisulphate, C. P., No. 2. | Contained 33 per cent. potassium bisulphate. Remainder sulphate, moisture and a trace of chloride. | L. F. Kebler. |

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| Potassium Citrate (1). | Contained 2.1 per cent. free acid as citric and excess of chloride—off color—acid to litmus paper. | E. L. Patch. |
| Potassium Citrate (2). | 1.05 per cent. free acid and excess of chloride. | E. L. Patch. |
| Potassium Citrate (3). | 1.40 per cent. free acid and .6 per cent. chloride. | E. L. Patch. |
| Potassium Iodide, C. P. | Contained sulphate, chloride, iodate and sodium. 5 G. required 3 Cc. $\frac{N}{10}$ acid to neutralize the alkalinity. Not even suitable for medicinal use. | L. F. Kebler. |

Potassa (KOH) C. P. pure. Pure by alcohol, etc.

| | *Solubility.* 15° C. in water. | *Chlorine.* | *NaOH.* | *Total Alkali.* as KOH. |
|---|---|---|---|---|
| 1. | 1.1 p. | .54 p. c. | 3.6 p. c. | 79.6 |
| 2. | 1.2 p. | .36 p. c. | 3.8 p. c. | 72.2 |
| 3. | 1.0 p. | .17 p. c. | 8.9 p. c. | 86.7 |
| 4. | 1.0 p. | .52 p. c. | 3.7 p. c. | 71.3 |

L. D. Havenhill.

C. W. Nestor, Lawrence, Kansas.

| | | |
|---|---|---|
| Pulsatilla Herb. | ⅓ true plant. ⅔ grass and other plants. | E. H. Gane. |
| Scammony Resin. | Mixed with Resin of Orizaba Jalap. (Ipomoea Orizabensis.) | E. H. Gane. |

Soda (NaOH).

| | *Solubility.* 15° C. in water. | *Chlorine.* | *NaOH.* |
|---|---|---|---|
| 1. | 2. p. | U. S. P. | 86.7 |
| 2. | 1.7 p. | U. S. P. | 86.5 |
| 3. | 3.5 p. | U. S. P. | 86.9 |
| 4. | 2.8 p. | 1 p. c. | 88.5 |

L. D. Havenhill.

C. W. Nestor, Lawrence, Kansas.

| | | |
|---|---|---|
| Soda, Caustic—Pure by Alcohol. | Contained objectionable amount of chloride. | E. H. Gane. |
| Sodium Sulphite, C. P. Cryst. | Contained 80 per cent. sulphite, 8.36 per cent. sulphate. | E. L. Patch. |
| Sodium Sulphite, Anhydrous. | Contained 63 per cent. anhydrous sulphite. | E. L. Patch. |
| Sodium Sulphite, C. P. Anhydrous. | Contained 82 per cent. anhydrous sulphite. | E. L. Patch. |
| Sodium Sulphite, Purified. | Contained 87 per cent. sulphite, 5.8 per cent. sulphate. | E. L. Patch. |
| Spirit of Camphor. | 40 out of 215 samples made with wood alcohol. Am. Drug. March, 9, 1903. | E. L. Patch. |
| Sulphur, Sublimed. | Some samples very acid. Have found as high as 0.6 per cent. free $H_2SO_4$. | E. H. Gane. |

The report was received with applause.

Mr. Gane called attention to some samples of spurious drugs which had been presented by Mr. Virgil Coblentz to the committee.

Mr. Lyons moved to adopt the report and refer for publication, and Mr. Wilbert seconded the motion.

The Chair suggested that there were some recommendations in the report that the Section should take notice of. Mr. Sayre then moved to refer to the committee just appointed to consider the Chairman's Address, but when Mr. Kebler suggested that as he was a member of the Committee on Drug Adulterations and also of the Committee on Chairman's Address, Mr. Sayre changed his motion to refer to a special committee to be appointed by the Chair to consider the report just read. Mr. Lyons seconded this motion.

MR. KREMERS: We have had a set of recommendations by the committee to which the matter was referred, and I do not see that we can improve the matter by referring to another committee. It seems to me it is time to take action.

MR. KEBLER: The object in view in asking the passage of the resolutions proposed is to send them to the respective Secretaries at Washington, and then they will be delivered to the proper men who have this work in charge; that is the way it will have to go. The idea is, to receive the sanction of the Association relative to that work. The idea of suggesting a referee in connection with the American Association of Official Agricultural Chemists is, that we take up the work on the same lines along which they have been working for a number of years, and thereby bring about uniformity of methods and results. The object is, to have the co-operation of a number of men throughout the country, and the object of the first resolution is to bring the analytical methods that are being used by the port chemists before the public, so that we will know exactly what they are doing and thus obtain an exact guide to ascertain whether they are the best, or whether they can be improved upon.

Thereupon Mr. Mayo moved as a substitute to the motion of Mr. Sayre that the report and the resolutions both be adopted, which motion had a second in Mr. Lowe and carried.

The Chair stated that the next order of business was the report presented at the last general session of the Committee on Revision of the U. S. Pharmacopœia, which was referred to this Section. Mr. C. M. Riley, of the committee, read the report, in the absence of the Chairman, Mr. Eccles.

## REPORT OF COMMITTEE ON REVISION OF THE UNITED STATES PHARMACOPŒIA.

*To the Officers and Members of the American Pharmaceutical Association:*

Your Committee on Revision of the Pharmacopœia respectfully submit the following report:

Finding ourselves confronted with the same difficulties that beset us a year ago in that we stood between the time of closing of the revision of 1890 and the opening of the new revision of 1900, with the contents of the latter still unknown, we concluded that rather than come before you with a very meagre or no report, we had better make a virtue of necessity and appeal to the revisers for assistance in our task. Why not make of this committee the mouthpiece of the revisers just prior to each decennial revision? About this time the pharmaceutical and medical press is clamoring for information concerning the probable changes, additions and methods adopted during the progress of revision. Why not supply them with such information simultaneously through the American Pharmaceutical Association? When Prof. J. P. Remington was appealed to in respect to this,

he replied: "I realize that the American Pharmaceutical Association Committee of Revision is sincerely desirous of aiding in the revision, and this is the proper channel through which information should be circulated." Acting upon this idea, a member of this committee, on the invitation of Prof. Remington, took a trip to Longport, N. J., via Atlantic City, and after a most enjoyable ride of miles alongside the sandy beach of the Atlantic Ocean in an open trolley car, finally reached the delightful summer residence of the chairman of the Committee of Revision of the United States Pharmacopœia. It stands on the very edge of the sandy beach, and on the porch, while discussing the prospective contents of the Revision of 1900, we watched a group of sea-nymphs disporting in the foaming surf and were near enough to hear much of what they were saying to each other. The "Kiddery," as Prof. Remington calls an annexed play-house for his children, is directly behind the residence from the beach, and this has been converted into pharmacopœial headquarters. In it research work is proceeding, correspondence attended to, circulars prepared and material and necessary apparatus kept. Here were found rows of fluid extracts in all stages of tests as regards precipitation, percolators enough to start a small manufactory, pigeon holes innumerable for envelopes, paper and other matter belonging to the many members of the committee, Monarch files filled with correspondence, apparatus for the preparation of granular effervescent salts, scales, books, chemicals and a card index that constitutes a complete reference guide to every letter, circular and subject of discussion and value in the work of revising. Assistants were busy on the various parts of the work. An Edison Mimeograph was being used for the production of the latest issued circular to the members. Fifty copies of each circular are printed, one-half of them being distributed among the twenty-five members and the rest filed away to meet the requirements of loss, damage or misplacement, or for other unforseen event that may make them of value. Up to the time that Prof. Remington became chairman of the committee, a hektograph was used in producing the circulars, but as they were all in script, they were much more difficult to read and were often so dim or blurred that deciphering them was occasionally a task. Now every word being in plain type and in jet black instead of purple, there is no difficulty in deciphering them, besides the economy of space, in that much more can be placed upon a single page. Every circular is numbered with the page number of the large book in which it is kept, so that it is an easy matter to turn to any desired circular without a moment's loss. The paper too is larger than was that used on the hektograph and every sheet comes from the manufacturer properly perforated for self-binding. The envelopes in which all circulars are mailed to the different members are of an unusually tough fibre having been made from old ropes. Twenty-five large bunches of them bore on each envelope the printed name and address of one member of the committee for each bunch. In everything economy, time and space seemed to be studied.

Prior to the giving of information concerning the work accomplished and the changes contemplated, Prof. Remington distinctly wished your committee to understand that up to the very last moment of going to press with the new revision of the Pharmacopœia no one could tell what changes might be made. This is why he is averse to presenting to the press reports that, while true at the time they are presented, may not represent the exact truth when the volume appears. So far as is at present known the statements of this report correctly represent the changes of the 1900 Pharmacopœia in the directions named. In *Synthetic Remedies* the committee first selected 20 of the best known and most important, and then after more thorough study reduced the number to about 15. No copyrighted names are to be given. Your committee would suggest to the revisers that they carefully consider the recent rulings of courts in this connection, if they have not already done so, before finally adopting this plan. In the Lanolin and other decisions it was held by the court that if a patented article has become popularized under a certain name, that that name is public property as soon as the patent expires. To give

such articles a pharmacopœial name prior to the expiration of the patent would be to permit the holder of the patent to hold a monopoly of the popularized name, thus defeating the very object aimed at by the committee in excluding such a name from the Pharmacopœia. Rather pursue the opposite course by adopting the firm name—copyrighted or not copyrighted—and thus taking away from them their practical monopoly as soon as their patent expires.

*Antitoxin, Serums, etc.*—A special commission of bacteriologists has been appointed to fix upon some satisfactory standard for these, and until this commission has made its report it will remain an unsettled question as to how these shall be cared for in the new volume. What is being sought for is a test sufficiently simple for any intelligent pharmacist to be able to use it in his pharmacy and that will take but a few minutes to perform. At present there is a complaint that the products of the various laboratories vary very widely in their strength. The most reasonable suggestion which your committee has seen offered, and which it is hoped will either be adopted or superseded by a better, is that of Dr. Hubbert of Detroit, Mich. He suggests that a standard toxin put up in ounce bottles bearing a stamp giving the exact amount necessary to neutralize a unit of antitoxin be supplied to druggists by the Congressional Committee having in charge the testing of biologic products. All such bottles would be made to conform to a common standard kept by this committee. These test toxins should be kept in a cool place away from light and used on serum supplies as bought. A serum of proper strength should only take a definite amount of this test solution to make a safe injection for a guinea pig of a definite weight. If a standard amount of the serum does not neutralize a minimal fatal dose of the toxin, when it is injected into the guinea pig, it will kill it. Such a serum is to be rejected by the pharmacist as unofficial. With a test of this kind available to every pharmacist even if one in a thousand never tried it, the few who did would keep up the standard because the manufacturers would know that a watch was kept upon their goods. The mere fact of the existence of a common standard would cause honest makers to produce goods of uniform strength without any other compulsion.

*Tinctures.*—At the recent international pharmacopœial convention at Brussels it was decided that all potent tinctures be made to represent 10 per cent. of the crude drug, and that every pharmacopœia in the civilized world be made to conform to this standard as quickly as possible. The United States Pharmacopœia will be the first to set the example, and, so far as tincture of aconite is concerned, it was most in need of such a change. Our tincture is now 35 per cent., that of France 20 per cent., of Germany 10 per cent., and of Great Britain only 5 per cent. This is an exceedingly dangerous condition of things, particularly for a progressive country like ours where medical journals are constantly copying and abstracting medical literature from foreign journals. A British prescription calling for tincture of aconite if of maximum strength would be seven times stronger if compounded with the American tincture, and might prove fatal. A British physician prescribing aconite in this country and failing to notice the difference in standards might seriously injure his patient without being conscious of the fact. As soon as the new pharmacopœia appears, pharmacists and physicians will have to remember that in prescriptions calling for two minims of the old tincture, seven minims of the new must be used. The present tincture is three and one-half times stronger than the new tincture will be. The change in other tinctures will be less marked. The tinctures of cantharides and strophanthus will be of double their present strength, the tinctures of belladonna leaves, colchicum, digitalis, nux vomica, gelsemium, hyoscyamus, cannabis Indica, physostigma and of stramonium seed will be reduced to two-thirds of their present strength, tincture of veratrum viride will be reduced to one-fourth of its present strength, tincture of lobelia will be half its present strength, but tincture of opium will remain unchanged. All of the non-potent tinctures except two will be made to represent 20 per cent. of the respective drugs from which they are produced. The two ex-

ceptions will be the tincture of sweet orange peel and a new tincture of lemon peel both of which will represent 50 per cent. of the fresh rind from the fruit.

*Syrups.*—The principal change made in the syrups is the increase in the amount of sugar called for in a number of them. By such addition of sugar the keeping quality in warm weather is increased, and they receive a better body for use where insoluble remedies are to be suspended in them. The most radical change is that made in syrup of tar. The use of boiling water and glycerin is abandoned. By the use of carbonate of magnesia and clean sand the tar is taken up by the water, and after filtering the sugar is added. Syrup of the iodide of iron instead of containing about 10 per cent. of ferrous iodide will, in conformity with the instructions of the Brussels International Convention, probably be reduced to 5 per cent. When so reduced it is claimed that it will be more stable under exposure than it is at present. The syrup of the phosphates of iron, quinine and strychnine darkens very much when standing in the stock bottle. As dispensed in various stores its color is markedly different according to its age. If fresh it is fairly clear. If long kept it may be very dark. In order to overcome this difficulty it is proposed to keep a solution of the salts and alkaloids in glycerin. When the syrup is called for equal parts of the glycerin solution and of simple syrup are to be added together and dispensed. When thus kept, and the syrup thus extemporaneously prepared just as called for, it can always be sent out quite clear and free from precipitates.

*Alcohol.*—The title deodorized alcohol will probably be abolished, and alcohol will hereafter be the article formerly known as deodorized. Absolute alcohol and diluted alcohol will remain as they now are.

*Granular Effervescent Salts.* New methods for preparing these are to be given. They are to be dried on a glass plate in a small tin bake-oven, such as the Acme, costing in the neighborhood of $1.50. This oven is to be put over a gas or oil jet and heated to a definite temperature through the aid of an oven-thermometer. Wooden spatulas are to be used in stirring. The directions are believed to be so simple and the cost of an entire outfit so small that it will be very easy for any druggist who wishes, to prepare them at low cost for himself. Among the new ones added is that of granular effervescent sodium phosphate.

*Sodium Carbonate.* The new official salt of this title will probably no longer be described as in colorless, monoclinic crystals or as efflorescing, if exposed. It will be in monohydrate granular crystals that are permanent in the air. Instead of ten molecules of water it will contain but one.

*Compound Solution of Cresol.* This proposed new official preparation is intended as an antiseptic for the use of the physician. It will be of 50 per cent. strength. Your committee did not get its exact composition from Professor Remington, but we judge it is something like creolin, and will be used just as that article now is.

*Cactus Grandiflora.* There was some talk of putting this into the Pharmacopœia, but, on investigating the market, it was found that none of it could be had in this country, so it is likely to be dropped from further consideration.

*Iodoform.* The present Pharmacopœia declares that this article should have a sp. gr. of 2.0 at 15° C. Investigation reveals the fact that the article upon the market by this name varies in sp. gr. from 2.0 to 4.0. The committee is now at work investigating the matter.

Professor Remington says that "it cannot be hoped that the United States Pharmacopœia will please everybody." This, no doubt, is true; but your committee would hasten to assure him that the American Pharmaceutical Association will, without doubt, be pleased with it, and even its Committee on Revision, in its critical moods, will not on any occasion be in the slightest degree fault-finding. No human work ever has been or ever can be perfect, and criticisms and corrections should always be given in a spirit of affection and friendliness. We only wish that we had a fair opportunity to study out

some change that could be made in the 1900 Pharmacopœia that would prove to be an improvement. Very likely such an opportunity will be given to our successors next year. Even in this inopportune moment we cannot refrain from making some guesses regarding what we deem might be helpful to pharmacists. One exceedingly important point which, if not already adopted by the revisers should be at the earliest moment, is the adapting the nomenclature to all such possible legislation as that of the Bostwick-Dowling bill, in New York, which but for the veto of Governor Odell would have become a law. Pharmacopœial titles should either be chosen in a way to permit of commercial articles of the same kind bearing a different title, or else the Pharmacopœia should recognize two or more grades of that article under the same title. The druggists of New York, had the bill named become a law, would have been in danger of losing their licenses as pharmacists for selling as naphthalin for moths an article that was different from the naphthalin of the Pharmacopœia in quality. Even to-day, in that State, the Board of Pharmacy and the Board of Health hold the right, if they desired to use it, to fine any pharmacist who sells commercial naphthalin when called for by that name, and fine them with equal ease if they sell it to any person as camphor-balls or camphor-flakes. All commercial goods bearing a pharmacopœial title—and there are many of them—are sold in violation of law in every instance where they are below the pharmacopœial standard. Nor is New York State the only one in which this dangerous plan of making the United States Pharmacopœia the standard for goods it never was intended to control. But few of the plasters dispensed upon prescription in this country conform to the Pharmacopœia. Many articles of a dangerous character, when called for by retail, such as the various ointments of mercury and its salts, would produce much harm if given of full official strength. Unguentum Aquæ Rosæ should bear no other official title than its English equivalent of Ointment of Rose Water. To add the name Cold Cream is a mistake. It should leave that popular title for such goods as the public is accustomed to buy under that name in the regions where they reside. Vaselin cold cream, or cold cream containing petroleum jelly, is the choice of some customers. Why should the druggist be endangered with fines, imprisonment and loss of right to practice his profession for selling as cold cream an article which his customers demand under that title ? They do not want and will not take ointment of rose water. Ointment of zinc oxide is very frequently sold over the counter in five and ten cents' worth. In hot weather the official article is unpleasant to handle and unsatisfactory to such customers. A little wax added to stiffen it is then a decided improvement. In many States it has now become a crime to make such an addition, however satisfactory it may be to customer or dealer.

R. G. Eccles, *Chairman.*
John F. Patton,
C. M. Riley.

The report was received with applause.

Mr. Kebler, seconded by Mr. Wilbert, moved to adopt the report just read.

Mr. Houghton: Mr. Chairman and Gentlemen of the Association: Owing to the fact that I am a member of the Special Committee on Antitoxins appointed by the Revision Committee of the United States Pharmacopœia, and since this committee has had a number of meetings to discuss the feasibility of the introduction of antidiphtheritic serum into the Pharmacopœia, with suitable tests for purity, strength, etc., it may be of interest to the members to point out some of the difficulties in connection with this subject, inasmuch as one of the recommendations in the report is for the adoption of a method of testing antidiphtheritic serum which can be applied by the pharma-

cist. This method, as outlined in the report, is substantially that formerly employed by Prof. Ehrlich, and utilized in the various biologic laboratories of the world for the testing of antitoxin. At the present time this method has been, owing to the number of different discoveries by Prof. Ehrlich and other workers, substituted by a more complicated, but more accurate method. In order that you may thoroughly understand the difference between the method outlined in the report and the method that is now used by nearly every laboratory in the country, whether private or municipal, that is recognized in England, and in fact almost the world over as being the best method at the present time, it may be well to briefly explain the two.

In the early history of the manufacture of antidiphtheritic serum, Prof. Ehrlich devised a method which is known by his name, for standardizing the product. As a basis of this method he worked out the antitoxic unit for determining the activity of a given product. This unit is ten times that amount of antidiphtheritic serum which will neutralize ten times the minimum fatal dose of diphtheria poison when the two are mixed together and injected subcutaneously into a test guinea-pig weighing 250 grams. The old method of determining the number of units was to first determine the minimum killing dose of a given sample of diphtheria toxin when injected subcutaneously into guinea-pigs of the size just mentioned. This dose should kill within four days' time. When the strength of the toxin had been determined, the several portions of it were measured out into sterilized glass capsules, each portion being exactly ten times the minimum killing dose for the test animal. To each of these several portions of diphtheria toxin was added a variable quantity of the antidiphtheritic serum after being diluted with water, the portions of serum perhaps varying something as follows: In capsule No. 1, .02 Cc. of the serum; No. 2, .001 Cc.; No. 3, .00066 Cc.; No. 4, .0005 Cc., etc., the bulk of the mixed toxin and serum being made up to a definite quantity, about 2 Cc., with sterilized physiological salt solution; then the mixture was injected into test guinea-pigs, which were afterwards kept under constant conditions. From time to time the animals would be examined, and the dead ones removed. At the end of four days the final results would be checked up and the number of dead animals determined. The animal receiving the smallest amount of the antidiphtheritic serum mixed with the toxin, that survived, is said to have received .1 of an antitoxic unit. Supposing this animal received 0.005 of a Cc. of serum mixed with the ten times minimum fatal dose of toxin, we would say that the serum contained 200 units per Cc. As you will see, this method is carried out simply by determining the amount of a given serum that will neutralize when mixed with ten times the minimum fatal dose of diphtheria toxin and injected directly into test animals.

The subsequent work of Ehrlich and his pupils shows that the diphtheria toxins gradually lose their killing power; *i. e.*, a toxin that will kill the test guinea-pig in a dose of .02 of a Cc. might have become so weak in its poisonous action in a couple of months that double the quantity of the toxin would be necessary to produce the same results. On the other hand they found that a toxin, when freshly made, that would neutralize .0005 of its volume of antitoxin, when the two were mixed together and injected into the test animal, would still neutralize very nearly the same amount of antitoxin. Consequently, from these experiments, Ehrlich concluded that the ultimate toxic molecule was composed of two affinities: one possessing killing action on animals, that readily decomposes, which he called a toxaphore; the other, which was not poisonous to animals but still combined with the antitoxin, he called a heptaphore.

In case the proposed method of sending out toxin to be employed by the pharmacist in testing antitoxin were adopted, it would be found that the toxin gradually lost its strength, and, if he determined the minimum killing dose upon guinea-pigs, he would find it much greater than at the time the toxin was prepared, and if it were mixed with the suspected antidiphtheritic serum, the test would show that the number of antitoxic units was very much less perhaps than was claimed on the label. This would be ex-

tremely detrimental to the best interests of all concerned, and would cause a great amount of confusion.

To obviate the difficulties of the old method of testing antitoxin, Ehrlich devised a method of drying antidiphtheritic serum, and preserving it so that it remained unchanged for a long time. He assayed this serum very accurately, and determined the exact amount of antitoxin that would neutralize one hundred times the minimum fatal dose of a fresh diphtheria toxin. This amount of serum contains one unit.

At the present time the revised method of standardizing the serum, as already stated, has been adopted by nearly every laboratory in the civilized world. Each laboratory sends to Prof. Ehrlich, every three months, for quantities of the standard antidiphtheritic serum, which they employ for standardizing their own toxin that is to be used for standardizing their antitoxin, the *modus operandi* of the assay being briefly as follows:

A fresh toxin is selected. The amount of this toxin that will exactly neutralize one unit of Erhlich's test serum, and still contain sufficient toxic power to kill a test guinea-pig, is called the L+ dose, and is taken as the unit of measurement for determining the strength of the antidiphtheritic serum that is to be tested. This quantity of toxin is mixed with variable amounts of the antidiphtheritic serum to be tested, and the amount of serum that will save the guinea-pig receiving this L+ dose of toxin is said to contain one unit of immunity.

As already stated, practically all the serums on the American market are standardized by this revised method of Ehrlich, and in case the antiquated method proposed in this report were adopted, the pharmacist would obtain results that varied considerably from those that had been obtained in the laboratory.

Again, another difficulty entering into the question of the pharmacist testing antidiphtheritic serum is the scarcity of test guinea-pigs to be obtained. It should be remembered that only those animals can be employed which are progeny of animals that have never been used for laboratory purposes, otherwise the degree of resistance of the animal would be so variable that the results would not correspond.

Much more might be said on this subject, but I think I have said sufficient to point out the danger of our relying upon the method of assay proposed in the report.

Mr. Rusby wanted to know if the adoption of the report would carry with it an endorsement of the recommendations of the committee. Mr. Lyons thought not, as this was simply what the Revision Committee was contemplating doing.

MR. HOUGHTON: The committee I had reference to was the Special Committee appointed by the Revision Committee to consider this subject thoroughly, and recommend or not recommend the adoption of antidiphtheritic serum by the U. S. Pharmacopœia Revision Committee. We have not made our report as yet, and perhaps all this is somewhat premature, but I thought it might be well to let the members know the lines we are working on.

MR. HALLBERG: Would it not be possible for the Marine Hospital and Public Health Service to furnish the anti-toxin, and for the Agricultural Department to furnish the animals. It will be very difficult for the average pharmacist to go out and catch the guinea-pigs. You know how inaccessible the "Soo" is this morning: a great many tried to get there and failed. It seems to me there should be a standard guinea-pig, and that the Agricultural Department should furnish him. [Great laughter.]

Mr. Rusby then made a motion to reconsider the subject, and to substitute the word "accept"—accept the report, instead of "adopt."

THE CHAIRMAN: The report has already been received. It is now a question of *accepting* or *adopting*. The question is, upon the report of the Committee on Pharmacopœia, and as I understand, Mr. Rusby thinks we have adopted this report and thereby adopted the recommendations of the committee, and he says if this commits the Association to these recommendations he is opposed to it, and therefore moves a reconsideration of that action, I will put the vote again. I mean on the report of the Committee on Revision of the Pharmacopœia.

MR. RUSBY: That is it, Mr. Chairman. I am not sure whether it commits us or not, and I move to reconsider.

The motion to reconsider was then put, and carried.

Mr. Lowe then moved that the word "accept" be substituted for the word "adopt," in receiving the report of the committee, which motion found a second in Mr. Hallberg, and was put and carried.

The Chair stated that nominations for officers for the ensuing year were now in order, and reminded the members that while nominations might be made now, other nominations might also, under the rule, be made at the last session of the Section previous to the vote on officers.

Mr. Lowe thereupon nominated Mr. Joseph W. England, of Philadelphia, for Chairman, and said:

*Gentlemen*, Mr. England was chief pharmacist of the great Philadelphia Hospital for some ten years—a hospital containing from a thousand to fifteen hundred patients. He is a pharmacist of large ability, and a thoroughly scientific man. He has been Secretary of this Section for two years, and would have been here to-day but for illness in his family occurring at the very last minute. Of course he would not have been justified in coming under the circumstances. I think it is due Mr. England on behalf of his services in this Section that he receive this honor.

Mr. Koch, of Pittsburg, seconded the nomination of Mr. England.

MR. HALLBERG: I am opposed to electing a man to the position of Chairman of this Section when he is absent from the meeting. It is not according to our rule. I therefore nominate Mr. M. I. Wilbert, of Philadelphia, for the place. He has also done work in the hospital and done work along the same line.

Mr. Alpers nominated Mr. W. A. Puckner, of Chicago, for Chairman. Mr. Kebler seconded the motion.

MR. LOWE: Mr. Chairman, I do not think Mr. England should be discriminated against on account of something he could not control. He intended all along to be here, but illness in his family prevented, and his duty was at home, under the circumstances. I do not think he should be excluded from being Chairman of this Section because of this fact. He is a man of large scientific ability, who will compare favorably with many of the Chairmen who have previously held this position, and I hope he will be thus honored.

Mr. Rusby said he would have seconded the nomination of Mr. England at once, if he had not understood there was a rule against electing an absent member. Mr. Hallberg said there was no fixed rule—he had refer-

ence to the custom in such matter. Thereupon Mr. Rusby seconded the motion of Mr. Lowe.

The Chair called for nominations for Secretary, and Mr. Lowe nominated Mr. M. I. Wilbert, of Philadelphia, for that place. Mr. Caspari nominated Mr. W. A. Puckner, of Chicago, saying that he knew Philadelphia did not want both places, and that he thought it would be fair to go to a different part of the country for one of them. Mr. Wilbert asked to withdraw his name, saying he did not think it would be possible for him to be at the Kansas City meeting next year.

Mr. Alpers nominated Mr. Geo. M. Beringer for Secretary, but Mr. Beringer begged to decline the honor, saying that that would again be putting two Philadelphia men in nomination.

Mr. Puckner arose at this point to say that, while he appreciated the kind motive that prompted the placing of his name in nomination for Chairman, he was a believer in advancement—a believer in civil service methods—and agreed with the position of Mr. Lowe that a man should be allowed to work up to the place of Chairman from that of Secretary, and he therefore desired to withdraw his name for Chairman.

Mr. J. W. T. Knox was put in nomination for Secretary by Mr. Kirchgessner, but Mr. Knox said he thought the Secretary of the Section should be a man actively engaged in scientific work, and that he had not been so engaged for five or six years, and therefore begged to withdraw his name.

Mr. Caspari suggested that he thought it would be proper to allow the gentlemen who wished to withdraw their names from nomination to do so without taking a vote on them when the time came.

Mr. Alpers moved to proceed with the regular order of business, and the motion was seconded by Mr. Lyons and carried. Thereupon the Chair announced the reading of papers to be now in order, and called on Mr. Rusby to read a paper on the Jaborandi of the market, which he did, exhibiting specimen leaves of the different varieties of the plant described, including some spurious specimens, from which one leaflet was absent:

## THE PILOCARPUS LEAVES OF COMMERCE.

BY H. H. RUSBY.

There are probably few, if any, common drugs of commerce which represent a higher percentage of spurious goods than does pilocarpus. Our large manufacturers are more fortunate in this respect than the retail pharmacists. The former purchase the drug mostly after assaying a sample, the sample being frequently sent from London and the drug ordered by cable and specially imported. With such exceptions, I should say that probably ninety per cent. of the article sold in the ordinary course of trade in New York during recent years has been worthless or very poor. For this, the dealers are not wholly to blame. One of the two species recognized by the U. S. P. embodies an error by that work, since that

species, *P. Selloanus*, or Rio Janeiro Jaborandi, is nearly worthless. When the book was published, this was not known, a fact which illustrates the importance of having supplements to the Pharmacopœia published from time to time during the interval between the revisions.

The above statements should be supplemented by saying that there are few drugs the identity of which is less known in the ordinary ranks of pharmacy than pilocarpus. My object is therefore to make those present more familiar with the general appearance of commercial samples of genuine and spurious goods, and this presentation might better be called an exhibition of samples, with comments, than a scientific paper. We are chiefly indebted for our knowledge of pilocarpus to the work of Mr. E. M. Holmes, and I present but little that has not already been published by him.

Our present official definition of pilocarpus includes *P. Selloanus* Engler, the Rio Janeiro Jaborandi, and *P. Jaborandi* Holmes, the Pernambuco or Yellow Jaborandi. That of the next edition will substitute *P. microphyllus*, Stapf, the small-leaved or Maranham Jaborandi, for *P. Selloanus*. I will present *P. microphyllus* first, because it is the most distinctive in appearance of them all. The following is its description: 1.3 to 3.7 Cm. (½ to 1½ in.) long by 0.8 to 1.6 Cm. (⅓ to 3-5 in.) broad; the lateral leaflets without petiolule, rhomboidally oval to obovate, acute at the base, blunt and unequally emarginate at the summit; the terminal leaflets on short, margined petiolules, almost equally oval to obovate and rather narrower than the lateral, with which they otherwise agree; all thickish and rigid, entire on the margin, smooth, dull-green, finely pellucid—punctate against the light and blackish-dotted by reflected light—midrib stout and veins rather coarsely reticulate, lightly prominent underneath; peculiarly aromatic when crushed and warmed in the hand; taste aromatic, salty, bitterish, later slightly pungent and sialogogue. Schneider reports the grayish-green powder as having upper epidermal cells which measure 15 to 17 mikrons by 23 to 35 mikrons, the lower somewhat smaller, outer palisade-cells 30 to 40 mikrons long, and few and small crystals. The only commercial articles to be mistaken for these are the leaflets of *Swartzia*. The general appearance is quite similar, but the notched summit and the pellucid dots, both characteristic of all *Pilocarpus* leaves, are wanting. Swartzia is entirely wanting in alkaloid. This species of Jaborandi is now generally regarded as the best of all. It yields an average of perhaps 0.85 per cent. of pilocarpine. This exhibits some differences from pilocarpine from other species, and it probably carries a little of some other alkaloid not yet differentiated. It may be remarked that few drugs differ more commonly and more widely in the alkaloidal yield of different lots of an identical variety than the Jaborandis.

*P. Jaborandi*, or Pernambuco Jaborandi, may be described as follows: Very shortly and stoutly petioluled, the blades, 6 to 12 Cm. (2½ to 5

in.), broad, oblong or oval, occasionally a very little narrower above or below the middle, usually slightly unequal at the base (except the terminal leaflet), blunt and notched at the summit, entire and thinly revolute at the margin, yellowish to brownish green, smooth and slightly shining, thick and leathery, usually not or little folded or wrinkled, the reticulate venation very prominent on both surfaces, especially underneath, strongly pellucid punctate; odor and taste similar to those of *P. microphyllus*. The powder is yellowish-green, showing upper epidermal cells 18 to 22 mikrons by 45 to 55 mikrons, crystals 30 mikrons long. The few hairs present are said by Geiger to be 440 to 600 mikrons long. This variety contains nearly the same amount of pilocarpine as that above described. The distinctive characters of this variety are its large size, yellowish shade, strong and prominent venation, great thickness and toughness, and smoothness a densely velvety hairy, and bright yellow lower surface is observed in leaves sometimes mixed, in small numbers with this sort. They closely resemble the others in other respects. These relationships are unknown to the writer.

This brings us to the consideration of those distinctly spurious jaborandi leaves which are really in the genus Pilocarpus (which possesses about 15 species), which are worthless or comparatively so.

*P. pennatifolius* Linn., most closely resembles *P. Jaborandi*, and it is easy, even for one who knows them well, to pass it for such upon casual observation. Without giving a full description of it, the following distinctions may be pointed out. The leaf is relatively narrower than *P. Jaborandi*, and is usually narrowed somewhat either above or below the middle, usually the latter. It is normally of a dull-green, though over-ripe leaves may take on a yellowish color, somewhat like that of the genuine. It is not so thick, nor rigid, nor smooth, and the venation is not nearly so prominent. It yields a dull green, slightly grayish-green powder. The yield of pilocarpine from good leaves of this variety is only 0.27 per cent. to 0.3 per per cent., and it is often much less. This is the most common form of jaborandi in the market. It is the leaf intended by the Pharmacopœia when it says *P. Selloanus* Engler., the supposition being that the terms are synonymous.

*Paraguay Jaborandi* is commonly regarded as being identical, as a species, with the Rio. If so, then *P. pennatifolius*, last considered, and *P. Selloanus* are synonymous. This question awaits further evidence, but the writer believes them probably distinct, in which case the Paraguay drug is to bear the name *P. Selloanus*. This leaf varies still further, in the same directions, from *P. Jaborandi* than does *P. Selloanus*. In other words, *P. pennatifolius* has characters about intermediate between the other two. It is not likely that the Paraguay leaf will be mistaken for the Pernambuco, though the Rio leaf may be. The Paraguay is much narrowed, especially the basal portion. It is rarely even slightly yellowish, being of a very dull,

sometimes gray-green. It is thinner, the venation not at all prominent and it is not at all shining, and its powder is distinctly gray-green. It contains practically no pilocarpine. It is not common in the market, so far as my experience goes.

*P. trachylophus* Holmes, the Ceara or Black Jaborandi, is quite common in market and is readily distinguished from all others. The mass presents a dark, almost blackish smudgy-green color, due to the upper leaf-surfaces, the lower being of a brown-green and densely velvety-hairy. The leaf averages about half as large as the Pernambuco variety. It is oblong in shape and thickish, and the edges are strongly disposed to curl or fold back. This curling is not the fine, regular and uniform curving usually denominated "revolute," but is irregular and interrupted, so as to give to the margin of this leaf a peculiarly non-uniform appearance. It yields a dark-green powder, full of hairs about 300 mikrons long, with few and small crystals and with upper epidermal cells 30 to 40 mikrons in diameter. It was found by Paul and Cownley to contain about 0.4 per cent. of alkaloid, but very distinct from pilocarpine. Its use is not at all admissible, though much of it is used.

The varieties remaining to be considered have but one leaflet to the leaf, hence are commonly, but not with strict correctness, spoken of as "simple-leaved" species.

*P. spicatus* St. Hil., or Aracati Jaborandi is the most important commercially. It is of a dark-brown, smudgy color, is short, broad, thickish, smooth and slightly shining, and has a very stemmy character, usually, many twigs, bearing several leaves or leaf-bases attached, being included. It has a peculiar acrid taste and sialogogue effect, reminding one, in a mild way, of Pellitory root, in this particular. It yields a dull-brown powder, instantly distinguished from those of all the other varieties. It contains a little alkaloid, but this is not pilocarpine. The sample here exhibited was given by a State Board of Pharmacy at an examination, they treating it as genuine Jaborandi. Those students who had been properly taught this subject would certainly not have called it Jaborandi, and would have suffered in consequence, while those who had been taught at the institution where the examiners held sway would have profited by the error, a trick not infrequently resorted to by Boards of Pharmacy in some eastern states.

*P. racemosus* Vahl, is little seen. It has been claimed that it contains more alkaloid than any other, but its composition requires study. It is very doubtful if the alkaloid is largely pilocarpine.

As to the term Jaborandi, it is a common name in tropical America, applied to many native drugs not related to Pilocarpus. Hence, it would be advisable to decrease and gradually eliminate the use of that name in commerce, getting the more definite term *Pilocarpus* used instead.

Mr. Rusby's paper was heartily applauded.

The chair stated, without objection, the paper would be referred for publication, and it was so ordered.

MR. LOWE: I only want to say that this seems to me to be a very important paper because there is no drug in the Pharmacopœia of more importance, so far as its medicinal value goes. It is the only drug combining sialogogue and diaphoretic properties, and it is a drug that ought to be selected on account of its great medicinal value.

MR. PUCKNER: The manufacturers would thoroughly appreciate it if the impure drug were crowded out of the market. At one time it was hard for us to get the drug assaying more than $\frac{1.5}{100}$ of one per cent.; then, all at once, we received some of the drug that went up to $\frac{9.7}{100}$ of one per cent. alkaloidal content.

MR. KEBLER: The point made by Mr. Puckner is a very important one, and reminds me of an experience I had while in commercial life, where I repeatedly turned down Jaborandi leaves, until manufacturers said, "If you are going to turn down everything, we can't buy anything any more." The point I want to make in this connection is, that this product now, under the recent act of Congress can be excluded by the Agricultural Department. But while this product probably could be kept out by the recent act of Congress, the difficulty encountered is the trouble we now find in connection with the wording of the import rulings, and that manufacturers are continually sending in a consignment labeled, "chemicals," irrespective of what they contain, while medicinal herbs are also sent in in the same manner, without designation as to what the contents of the package are, excepting "medicinal herb," or "medicinal product;" and it is decidedly difficult to get at the contents of these packages and eliminate the products of an inferior quality, which we have good reason to believe ought not to come in. The question is, How are we to get at this matter?

MR. RUSBY: Mr. Kebler asks how we are to get at it. I will tell you how you can know about it. Do not buy any until you have got the certificate of some bureau that it is genuine.

In the absence of the author, Mr. Kebler then read a paper on East Tennessee Pink-root:

## EAST TENNESSEE PINK-ROOT.

BY RODNEY H. TRUE, WASHINGTON, D. C.

In connection with experiments now being made by the office of Drug and Medicinal Plant Investigations of the Bureau of Plant Industry in the Department of Agriculture, it has seemed desirable to undertake the cultivation of a number of forms of wild drug plants. Among others, the pink-root (*Spigelia marilandica*) has been included. Early last spring, in accordance with the rules of the Department, bids were asked for from several dealers in crude drugs in order to obtain a supply of fresh roots for cultivation at Washington. The bid was awarded to a dealer in eastern Tennessee, who promptly filled it with a plant having at that time from two to six leaves of an elliptical form, with hairy surfaces. The rather slender stems were also hairy. Suspicion was immediately aroused by the appearance of the plant, which suspicion was confirmed when, some

weeks later, a blue blossom appeared. The plant actually obtained was *Ruellia ciliosa*, and in one of its long-flowered forms.

The presence of a member of the family of the Acanthaceæ on the market under the name of pink-root has been long suspected by the writer, but his evidence was altogether histological, based on the structure of approximately fifty samples. The feature suggesting a member of this family as a probable source of much of the pink-root seen was the abundance of a peculiar cystolith or limy concretion occurring in many of the cells of the cortex in both rhizome and roots. In addition to the cystoliths, certain elements were found to be heavily thickened, giving in transverse section the appearance of the cross-section of a fiber. Until this year, however, the writer has been unable to supplement this histological evidence with that obtained from the growing plants. At the present time this confusion seems to be widespread. A number of authors of repute, in dealing with pink-root, have seen and described roots and rhizomes of this Ruellia under the name of Spigelia. The error has even crept into some school text-books on *materia medica*.

We have here, therefore, evidence of widespread substitution, probably made in good faith by collectors of crude drugs. Since, as a rule, the members of the Acanthaceæ are innocuous as regards therapeutic action, in the absence of further evidence it seems probable that this substitution has had much to do with the bad reputation which pink-root has gradually come to have, and may, in a degree, account for what appears to be a gradual elimination of this drug from use.

The chair stated that, without objection, the paper would be referred for publication, and called for remarks, but there were none.

Mr. Geo. M. Beringer then read a paper on phenacetin and acetanilid tests, giving some interesting chemical illustrations of his subject, and followed it by a paper on commercial phenacetin, the full text of the papers being as follows:

## TESTS FOR PHENACETIN AND ACETANILID.

BY GEORGE M. BERINGER.

Having occasion to examine a number of samples of phenacetin, in order to determine the presence of acetanilid as an adulterant, the writer was led to make a review of the statements made as to the physical properties, reactions and tests for these two products. The object in view was to discover some additional tests that would enable the pharmacist readily to distinguish between these two and to easily detect the presence of acetanilid as an adulterant in phenacetin. While the results of my experiments in some directions, have not been as satisfactory as desired, they are, nevertheless, sufficiently definite to warrant publication and to invite other investigations.

The appearance of these two chemicals either in powder or crystals, may very closely similate each other. Phenacetin recrystallized from hot aqueous solutions assumes the form of micaceous crystals identical in appearance with those obtained from acetanilid similarly treated. While acetanilid is decidedly more soluble in the common solvents and possesses a peculiar taste, yet these properties are not sufficiently distinctive to serve to any great extent in distinguishing between the two.

While both dissolve in cold sulphuric acid without production of color, on heating such solutions to boiling, it must be noted that phenacetin becomes quickly carbonized and the acid assumes a brown or purple-brown color, the acetanilid solutions show a darkening only after prolonged boiling.

With nitric acid phenacetin produces at once a deep orange-yellow color, while acetanilid in the *cold* dissolves without any coloration, but if the solution be warmed even to 65° C., then decomposition takes place with the production of a yellow nitro-compound and the liberation of nitrous fumes.

*The Melting Point.*—The melting point of acetanilid is given by the United States Pharmacopœia at 113° C., and in the British Pharmacopœia at 113.5° C., and by the German Pharmacopœia at 113° to 114° C. Phenacetin is stated in the British Pharmacopœia to melt at 135° C., and in the German this is given at 134° to 135° C. For use in these experiments samples of phenacetin and acetanilid were procured from the most reliable sources and tested with the following results: Acetanilid melted in three separate tests at 113° C., 113.2° C. and 113.4° C., and phenacetin completely between 134.5° C. and 135° C., the fusion in each case being sharp and clear at these temperatures. Pure phenacetin shows a glistening appearance like the moistening of the tube at 132°, and at 133° softens. Mixtures of acetanilid and phenacetin were then prepared in definite proportions and melting-point determinations made. It is to be specially noted that with such mixtures the melting-point is always below that of phenacetin, and in many proportions lower even than that of acetanilid, and moreover, there is an absence of the sharp, definite point of fusion that is characteristic of pure chemicals. The powder in the tube commences to shrink, then to soften, and then fuse, the melting usually extending over several degrees, and even then a waxy-looking portion may not liquefy until after a decided increase of temperature. Consequently, in the following table of melting points of such mixtures I have noted these various temperatures.

TABLE OF MELTING POINTS OF MIXTURES OF ACETANILID AND PHENACETIN.

| | Shrinks. | Softens. | Melts. | Complete Fusion. |
|---|---|---|---|---|
| Acetanilid 1 per cent. | 126° | 128° | 131°–132° | 134° |
| " 2 " " | 115° | 125° | 130°–131° | 132° |
| " 3 " " | 110° | 124° | 128°–129° | 131° |
| " 4 " " | 105° | 120° | 125°–126° | 130° |
| " 5 " " | 100° | 108° | 112°–114° | 124° |
| " 10 " " | 100° | 105° | 110°–112° | 120° |
| " 15 " " | 95° | 105° | 110°–112° | 120° |
| " 20 " " | 92° | 100° | 105°–106° | 113° |
| " 25 " " | 90° | 94° | 95°–96° | 115° |
| " 30 " " | 90° | 92° | 94°–95° | 115° |
| " 35 " " | 85° | 90° | 92°–94° | 108° |
| " 40 " " | 84° | 90° | 91°–93° | 105° |
| " 45 " " | 82° | 90° | 92°–93° | 100° |
| " 50 " " | 80° | 86° | 90°–92° | 96° |
| " 55 " " | 77° | 86° | 90°–92° | 95° |
| " 60 " " | 82° | 88° | 90°–92° | 94° |
| " 65 " " | 82° | 87° | 90°–92° | 94° |
| " 70 " " | 87° | 90° | 91°–92° | 95° |
| " 75 " " | 88° | 90° | 92°–93° | 96° |
| " 80 " " | 88° | 90° | 91°–92° | 99° |
| " 85 " " | 90° | 92° | 95°–96° | 105° |
| " 90 " " | 92° | 95° | 100°–101° | 108° |
| " 95 " " | 96° | 102° | 107°–108° | 111° |

All temperatures given are Centigrade and determined with a thermometer certified at Yale observatory.

*Indophenol Reaction.*—The German Pharmacopœia gives this as one of the characteristic reactions for acetanilid and describes it as follows: "Take a solution of .2 Gm. of acetanilid in 2 Cc. of hydrochloric acid, and boil for 1 minute; add 4 Cc. carbolic acid solution and then some filtered saturated solution of chlorinated lime. There is produced a dirty *violet-blue* color, which upon the addition of ammonia becomes indigo blue." Hager (Pharmaceutische Praxis) describes this test and states that the color produced on the addition of chlorinated lime solution is *onion-red.*

My own experiments confirm this statement in Hager as to color, but I find that the test cannot serve to distinguish acetanilid from phenacetin, as the latter similarly treated, gives also the indophenol reaction, except that the colors are more intense and especially the final blue being brighter and deeper in tint.

*Schwartz's Test, the So-called Isonitrile Reaction.*—H. Schwartz (Pharm. Journ. (3) XVIII–1085) recommends this test as a distinctive reaction for acetanilid, and it has received recognition in the United States, British and German Pharmacopœias. It is generally given as follows: "On heating 0.1 Gm. of acetanilid with 5 Cc. of concentrated solution of

potassium or sodium hydroxide, the characteristic odor of aniline becomes noticeable. On now adding 1 Cc. of chloroform and again heating, the disagreeable odor of phenylisocyanide is evolved." The repugnant-smelling product of this reaction is now generally considered as phenyl-carbamine, $C_6H_5NC$. It was originally proposed by Hofmann as a test for aniline, and was known as Hofmann's isonitrile test, and is still quite commonly spoken of as the isonitrile reaction.

The official recognition of this reaction and its frequent citation by authors as a discriminating test for acetanilid has given to it a consideration and importance as unwarranted as it is unmerited. Much of the wholesale accusation of fraud recently made against American pharmacists is probably due to a misunderstanding of the value of this test. It must be remembered that this is a class or group reaction, and that numerous amines respond to it. Such careful authorities as Dr. Fischer and Flückiger recognize this, and state that phenacetin and other synthetics will also give this reaction.

The writer has no difficulty in obtaining this odorous reaction with pure phenacetin, provided the heating with the alkali has been continued long enough to liberate the base. Boiling from one to two minutes has proven at all times sufficient. It is true, that the base liberated from pure phenacetin is more aromatic than the aniline produced from acetanilid, yet on adding the chloroform and heating again, the phenyl-carbamine odor develops, and if the test-tube is set aside for only a few minutes it will become quite pronounced, so that mixtures of phenacetin and acetanilid, or even pure phenacetin, cannot be distinguished by this reaction from acetanilid, and the test can no longer be accepted as possessing any discriminating value.

Experiments by the writer show that if the salts are completely decomposed by continued boiling in a flask connected with a reflux condenser, the alkaline solution allowed to cool to the temperature of the room on a summer day (85°–90° F.), and then an excess of chloroform added to dissolve out the bases, that there is produced an abundance of the odorous substance even at this temperature. The chloroform separated contained but little of this principle, which remained behind in the alkaline liquid from which it could be extracted by petroleum ether.

*Hirschsohn's Bromine Water Test.* This simple and valuable test has been adopted in the British and German Pharmacopœias. It will no donbt be introduced in the forthcoming United States Pharmacopœia. It is usually stated thus: "0.1 Gm. phenacetin is dissolved in 10 Cc. water by boiling, the solution cooled and filtered and bromine water added until a yellow color results. In the presence of acetanilid the solution becomes turbid from the formation of parabromacetanilid."

Hirschsohn claimed that this test would readily detect 5 per cent. of

acetanilid present in phenacetin. My own experiments confirm this, and by concentrating the filtrate to 2 Cc. on the water-bath and again cooling thoroughly and filtering through a very small filter, I was enabled to obtain a precipitate in solutions prepared from phenacetin containing 2 per cent. acetanilid, and even such concentrated solutions from phenacetin containing 1 per cent. of the adulterant discharged the color of several drops of bromine water, and, after standing several hours, gave a slight precipitate. In applying this test one precaution is so be observed, namely, to thoroughly cool the solution before filtering, or there may be precipitated from the saturated solutions some crystals of the salts, beclouding the solution and the reaction.

*Color Reactions.* The color reactions given for these two products are not very numerous or distinctive, and some of the descriptions given are so indefinite or inaccurate that the writer was unable to verify the statements. As, for example, the following tests given by A. McLane Hamilton (A System of Legal Medicine, Vol. I, page 474 b.): "Acetanilid may be separated from an alkaline solution by the addition of chloroform. When hot nitric acid is added, a purple color will develop upon cooling. Nitrous acid gives a green color." I suspect that this author has confused the color reactions of antipyrine, as acetanilid does not so react.

The yellow color produced by phenacetin with nitric acid is far from distinctive, as mixtures of phenacetin and acetanilid in *all* proportions will give such coloration, and, as previously stated, pure acetanilid, if the nitric acid is only moderately warmed, will do the same.

The color reactions given by several writers as obtainable with such oxidizing agents as potassium permanganate and sulphuric acid with potassium dichromate are not reliable, as these reagents, in the presence of organic compounds, are very easily affected by not only the organic salts, but also the proportions of reagents used, temperature, etc., and so the colors produced are not stable or sufficiently uniform to serve as distinguishing tests.

A cold, saturated aqueous solution of acetanilid reduces ferric chloride and potassium ferricyanide solution, although somewhat slowly, with the production of a blue green precipitate. A similar solution of phenacetin reduces this test promptly, with the production of a handsome bright blue.

On boiling acetanilid with diluted hydrochloric acid a solution is obtained which colors pine wood (match-stick, for instance) a bright yellow, like Höhnel's test for lignin. A solution of phenacetin prepared in the same way was found to possess the same property, although the color was not quite as deep.

As color reactions are always more striking than colorless precipitates, or tests depending upon the generation of odorous substances, it appeared very desirous to obtain some distinctive color reactions that would be of value in distinguishing between phenacetin and acetanilid, and also ser-

viceable for detecting the latter as an adulterant. With this object in view, the writer reasoned that the bases liberated by the action of alkalies should yield distinctive color reactions. In order to determine this the following experiments were made:

.5 Gm. acetanilid, 20 Cc. solution of sodium hydroxide (1 to 2 of water), were boiled in a flask connected with a reflux condenser for half an hour. After cooling, this was extracted with 25 Cc. petroleum ether. The petroleum ether solution of the liberated aniline was separated, filtered, and the separating funnel and filter washed with sufficient petroleum ether to yield 25 Cc. of solution.

.5 Gm. phenacetin was similarly treated. With these solutions of the liberated bases a number of tests were made with various reagents, using in each test 1 Cc. of the petroleum ether solution, and the results noted and the colors produced in both liquids are exhibited in the following tabulated statement:

| Reagents. | Phenacetin. | Acetanilid. |
|---|---|---|
| No. 1. 2 Cc. solution of chlorinated soda. | Yellow at once. After agitating separates top layer orange; lower layer yellow, clear. After 8 hours top layer orange and clear; lower clear and almost colorless. | Purple red at once; separates top layer yellow; lower layer purple-red, then dirty brown-red, and cloudy at once. After 8 hours top layer clear yellow, with purplish precipitate at line of contact; lower layer yellow, with orange precipitate at bottom of tube. |
| No. 2. 2 Cc. of filtered saturated solution chlorinated lime. | Orange immediately; separates top layer clear orange; lower layer light yellow, soon colorless. After 8 hours top yellow orange; lower layer colorless, with white lime precipitate at bottom of tube. | On agitating, becomes purplish-red; on separating top layer yellow, lower layer purple-red, then dirty red and fades. After 8 hours top layer yellow, with purple precipitate at line of contact; lower layer colorless, with yellow precipitate at bottom of tube. |
| No. 3. 2 Cc. 1 per cent. chromic acid solution. | Produces a purple on agitating at once: on separating, top layer red; lower layer purple, with a purple precipitate (liquid soon becomes red). After 8 hours top layer orange-red; lower layer bright red, with a purple-brown precipitate. | At first no apparent reaction, then separates, top layer yellow; lower layer yellow, becoming green. After 8 hours top layer colorless; lower layer orange, with a dark green precipitate. |
| No. 4. 2 Cc. 1 per cent. solution potassium dichromate. | At first no apparent reaction; on separating, the top layer yellow; lower layer becoming red, then cloudy, with a brown precipitate. After 8 hours top layer orange, clear; lower layer brown and a light brown precipitate. | No reaction apparent. Separates, top layer colorless; lower layer yellow. After 8 hours no change. |

| Reagents. | Phenacetin. | Acetanilid. |
|---|---|---|
| No. 5. 1 Cc. 1 per cent. solution of potassium permanganate. | A purple reaction at once, separating top layer yellow; lower layer brown, with a brown precipitate. | A reaction at once. Separates, top layer colorless; lower layer brown, with a dark brown, nearly black, precipitate. |
| No. 6. 2 Cc. 1 per cent. solution potassium ferricyanide. | On separating, top layer yellow; lower, lilac, then purple-red, then cherry-red and cloudy. After 8 hours top layer red orange; lower layer dark green, with a dark green precipitate. | At first no reaction, then top layer becomes yellow; lower layer gradually green. After 8 hours, top layer yellow; lower layer bright green, and after 24 hours a green precipitate. |
| No. 7. 2 Cc. 1 per cent. solution ferric chloride nearly neutral. | Purple on agitating, and separating, top layer yellow; lower layer purple and cloudy. After 8 hours top layer bright red; lower layer purple-red, with a copious purple precipitate. | At first no reaction. Separates, top layer colorless; lower layer yellow, slowly changing to green. After 8 hours, top layer clear and colorless; lower layer dirty green, with a green precipitate. |
| No. 8. 2 Cc. of saturated cold solution of ammonium vanadate, then add 1 drop of sulphuric acid. | On agitating and separating, the top layer soon becomes red; the lower layer purple with a copious purple precipitate. After 8 hours, top layer clear red solution, with copious purplish precipitate; lower layer green, with a dark green precipitate. | On agitating, the top layer separates cloudy, and then clears up and is colorless; the lower layer yellow, then green, gradually deepening to a green-blue. After 8 hours, top layer colorless; lower layer nearly colorless, but holds suspended a dark green (nearly black) precipitate. |
| No. 9. 2 Cc. 5 per cent. solution of potassium chlorate, then add 3 drops of hydrochloric acid. | This separates the top layer at first deep purple and cloudy, soon fades and clears; the lower layer a red violet. After 8 hours, the top layer is faded to a faint pink; the lower layer colorless, with a violet precipitate at the line of contact. | Separates, the top layer colorless, but after a while a faint green tint; lower layer a faint lilac, and a green line at the point of contact between layers. After 8 hours, both layers nearly colorless, and the green line barely detected. |
| No. 10. 1 Cc. solution of mercuric nitrate. | On agitating, a bright purple; the top layer separates green; the lower layer purple, then violet, then red. After 8 hours both layers red. | At first, no color reaction. Top layer colorless; lower layer gradually becomes red orange color. |
| No. 11. 2 Cc. of water containing 4 drops bromine test solution. | Produces at once a deep brown, almost black, precipitate; separates, top layer with precipitate suspended; the lower layer colorless. | Becomes milky white; separates, the top layer clear, colorless; the lower layer milky white from precipitate. |

Another set of experiments were made using the same methods and quantities but substituting ether for petroleum ether. The results obtained

with the ether solutions, varied but little from those with the petroleum ether, proving that the bases were soluble in either solvent without materially affecting the results. In test No. 9 with potassium chlorate solution and hydrochloric acid, the ether solution possessed a decided advantage in the reaction with acetanilid as here, the green line of contact was more distinct and possessed a bright green iridescence which was permanent.

It is to be observed that the colors produced by phenacetin with many of these reagents are so much deeper than those produced by acetanilid, that the presence of the latter as an adulterant would be partly masked by the depth of color produced by the phenacetin. However, the tests with chlorinated soda, chlorinated lime. potassium ferricyanide, ferric chloride, ammonium vanadate, potassium chlorate, and bromine are all distinct and will serve as confirmatory tests for the recognition of either phenacetin or acetanilid and several with careful manipulation, will show the presence of the latter as an adulterant.

Experiments were made with various mixtures of acetanilid and phenacetin by this process, and the most satisfactory evidence was obtained by the use of the chlorinated soda and the chlorinated lime reagents and by adding the petroleum ether solution as a layer on top. By making control experiments with pure phenacetin and acetanilid, the effect of the mixtures could be readily noted. The results obtained with mixtures of five and fifty per cent. acetanilid were as follows:

| Reagents. | 5 per cent. acetanilid, 95 per cent. phenacetin. | 50 per cent. acetanilid, 50 per cent. phenacetin. |
|---|---|---|
| Solution chlorinated soda. | A purple-red produced at line of contact; on slightly shaking a momentary purplish coloration extends into the chlorinated soda solution changing quickly to a dirty red orange. On agitating, the solution becomes yellow and cloudy, and on separating the top layer is deep red orange; the lower layer is yellow and cloudy. | Immediately, a purple-red at line of contact and purple streaks enter into chlorinated soda solution. On agitating, a cloudy deep brown-red is produced. On separating, top layer is orange; lower layer is dirty red fading rapidly to a cloudy yellow liquid. |
| Solution chlorinated lime. | A red line at contact, the ether solution soon becoming cloudy red, and on agitating separates, top layer orange red; lower layer slightly yellow and cloudy. | Immediately, a purplish-red at line of contact changing to a dirty red. On agitating, the solutions become turbid brown-red, and on separating, top layer is yellow clear; lower layer cloudy yellow with dark precipitate at line of contact. |

Other mixtures showed varying tints of purple and red with the varia-

tion in the proportion of acetanilid present. In mixtures containing less than five per cent. of acetanilid the colors were lost in the orange-yellow produced by the phenacetin reaction, and this was fixed as the percentage of acetanilid detectable by this method.

For testing by this method, the experiment can be performed in a test-tube, using 0.1 Gm. of the phenacetin and 2 or 3 Cc. of solution of sodium hydroxide. After boiling, the tube is thoroughly cooled before extracting the bases with either ether or petroleum ether. The ethereal layer is removed with a pipette and the color producing reagents used as described above.

The writer realized that this method of testing, while not difficult for the chemist to perform, was hardly simple and quick enough to meet the requirements of the average pharmacist, and hence would not receive official recognition. As the initial color produced by the chlorinated soda solution with aniline is a purple, in marked contrast with the orange produced by the phenacetin base this was decided by comparative tests to be the most distinctive reaction and I directed my efforts towards improving the methods of applying this test with such apparatus and chemicals as should be at hand in every pharmacy. As a result of these efforts, I am enabled to offer three easy and rapid methods of applying this reaction, any one of which, with ordinary skill, can be applied in a few minutes and furnish reliable indications of the purity of the phenacetin.

The first requires a 6-inch test-tube fitted with a perforated cork and a bent glass tube as an outlet, and a small test-tube or clean vial and as reagents, sodium hydroxide and solution of chlorinated soda. In the test-tube is placed .1 Gm. of the phenacetin to be examined, 2 Cc. of sodium hydroxide solution (1 to 2) and 2 Cc. of distilled water, the cork and tube are fitted (so as to act as a miniature condenser), and the test-tube is heated until the contents boil briskly. Collect the *first few drops* that come over into the small test-tube or vial containing two or three Cc. of the solution of chlorinated soda. If the phenacetin is pure the color of the chlorinated soda solution is changed to a bright orange and it remains clear. If, however, acetanilid is present in any appreciable amount the very first drop that is condensed into the solution strikes a decided purple. If the percentage of acetanilid is small, then the liberated phenacetin base soon drowns out this color and hence the importance of catching the very first portion of the distillate which contains the larger proportion of aniline. The purple coloration is made blue by ammonia and discharged by hydrochloric acid and not again restored by the addition of ammonia. Where the percentage of acetanilid is large the chlorinated soda solution after the condensation of but a few drops of the distillate becomes from purple to purple-red, brown-red and quite turbid. Ether added to the solution dissolves out most of the coloring and leaves the aqueous solution nearly clear.

If solution of chlorinated lime is substituted for the chlorinated soda, the purplish tint is not distinct, but a cloudy brownish red (onion-red) is produced, and as phenacetin produces in the same test an orange-red of nearly the same color, the chlorinated soda is by far the most delicate and preferable reagent. This test can readily be performed in five minutes, and by a very little practice the average manipulator can detect the presence of 5 per cent. of acetanilid. The writer had no trouble to get a decided reaction with mixtures containing 3 per cent., but tests made on 1 per cent. mixtures were not sufficiently sharp to be satisfactory. Instead of a distinct purple, the 1 per cent. acetanilid mixture yielded a pinkish tint, changing to yellow, the faint purple being drowned out.

The second modification of the chlorinated soda reaction is still more simple and easy of application. 0.1 Gm. of the phenacetin is boiled for one minute in a clean test-tube with 3 Cc. of the sodium hydroxide solution (1–2), agitated thoroughly and set aside to cool (or, if there is need of haste, cool by the application of cold water to the tube); when cold, add 5 Cc. of the solution of chlorinated soda and shake thoroughly and set aside. If the phenacetin is pure, the liquid is not deeper in color than yellow, and is not turbid, but clear, except for a layer of crystals possibly some undecomposed phenacetin, which floats on top, and this layer becomes never more than a light yellow. If, however, acetanilid is present the color will be purple or red-brown, varying with the amount of the adulterant, and the separated top-layer is colored from a purplish red to a pinkish red. The addition of ether will dissolve these colorings and clear the solution, and serve also to bring out in contrast the pink or red produced by acetanilid.

Control experiments should be made with pure phenacetin and pure acetanilid, and by a little practice the eye soon becomes trained to detect the presence of even quite small amounts of acetanilid. Five per cent. can be readily detected, and gross adulteration or entire sophistication cannot fail to be discovered.

I found that acetanilid could be decomposed by the action of aluminum and strong solution of sodium hydroxide, and after such reduction the solution would react with sodium hypochlorite. This observation led to the discovery of the third test. As the aluminum and sodium hydroxide was necessarily a slow reaction, sodium peroxide was substituted with entire satisfaction, and the test is applied as follows: 0.1 Gm. of phenacetin is mixed on a clean paper with 1 Gm. of sodium peroxide. The mixture placed in a six-inch test-tube and 3 Cc. of water added. As soon as the violent ebullition is completed, thoroughly shake the contents of the tube and cool by immersion in cold water. When cold, add 5 Cc. of solution of chlorinated soda and shake thoroughly and set aside. If the phenacetin is pure, the liquid remains colorless, and even after long standing, never more than pale yellow, and the layer floating on top is not colored.

Acetanilid, similarly tested, gives a purple-red to brown-red, and the top layer of undecomposed crystals and precipitate becomes brown-red also. With mixtures of phenacetin and acetanilid the color is more or less purplish red, brownish red to pinkish, depending upon the percentage of the adulterant. This test is very delicate, and I have no trouble to detect the presence of 1 per cent. of acetanilid in phenacetin, the solution and top-layer in that dilution assuming a flesh-pink tint. The addition of ether dissolves the coloring and brings out these pink and red tints more distinctly. A more extended use of this test on commercial samples of phenacetin fully demonstrated its delicacy, but developed a need for caution in its application. In the presence of such organic substances as sugar, salicylic acid, sodium salicylate, salophen, and even sodium bicarbonate, all of which have been found as adulterants of phenacetin, the reaction of the sodium peroxide is so violent that it promptly causes deflagration with sufficient force to destroy the test tubes.

As sodium peroxide is not generally kept in stock by pharmacists, and as the test is accompanied by the serious objections above mentioned, I would advocate that the Pharmacopœia should adopt at least the second of these tests, and require that 1 Gm. phenacetin boiled for one minute with 3 Cc. solution of sodium hydroxide (1–2), the solution cooled, and then agitated with 5 Cc. solution of chlorinated soda should remain a clear yellow liquid. The production of purple-red or brown-red cloudy liquid or precipitate indicates the presence of acetanilid.

With the official description of melting point, Hirschsohn's bromine water test, and either of these color tests with sodium hypochlorite, the pharmacist will be amply provided with such tests easy of application that will protect him from the substitution of acetanilid for phenacetin and enable him to detect mixtures of these two.

## AN EXAMINATION OF SAMPLES OF COMMERCIAL PHENACETIN.

BY GEORGE M. BERINGER.

The sensational publication of the reports of the Board of Health of New York regarding the examination of phenacetin sold in that city, has evoked considerable discussion and feeling. The interest manifested was so general, and the influence of this publication was so widespread, that the writer decided to make an independent examination of a number of samples of phenacetin purchased throughout the country in order to obtain definite information regarding the quality of that chemical that was being dispensed in the United States.

Through the assistance of friends, samples were obtained from the following cities: Atlanta, Ga.; St. Louis; Detroit; New York; Newark, N. J.; Philadelphia; and Baltimore. The instructions given were that a reliable person was to purchase one or more powders of either five or ten grains of phenacetin in the usual way, so that the dealer would not suspect that the drug was wanted for any other purpose than as medicine. The sam-

ples were to be sealed and forwarded to me by mail or express. It was also requested that the purchases should not be made only from high grade pharmacies, but that they should see that all classes of drug stores were patronized, so that my samples should fairly represent the phenacetin that was being supplied.

In each city, my correspondent was a gentleman of undoubted reputation, and I have every reason to believe that my instructions were intelligently carried out, and I am indebted to these friends for their assistance. Three of these called my attention to examples of unsightly packages and careless dispensing, and this led me to make some observations on these lines also.

In the examination of these samples the following standard for the purity of phenacetin was adopted. It must be white, odorless and tasteless, melt at about 134° C.–135° C., and leave no residue on incineration; give a bright yellow color with nitric acid, and this solution must not become crimson on warming (antipyrine). 0.1 Gm. boiled with 10 Cc. of water, and the solution cooled and filtered must not give a turbidity or precipitate with bromine water.*

A pink or red color must not be produced either in the liquid or the precipitate when treated with sodium peroxide, and then adding solution of chlorinated soda, as proposed in my paper on the "Tests for Phenacetin and Acetanilid." This test having proved in my hands the most delicate of the three color reactions there proposed, it was adopted in these examinations. In every case where acetanilid was indicated as present in only small proportions by this test, and slight variation from the normal melting point, the first of the special tests there proposed, namely, the distillation with sodium hydroxide and collecting the first drop of the distillate in the solution of chlorinated soda gave positive and distinct reactions. The second of the tests there proposed, namely, boiling with sodium hydroxide solution, and adding to the cooled liquid solution of chlorinated soda, also gave decided reactions wherever acetanilid was substituted entirely or used in appreciable amount.

The Schwartz test, the phenyl-isocyanide odor test, having proved unreliable, was abandoned, except so far as used, to prove the absence of either acetanilid or phenacetin.

The color reaction produced by phenacetin with chromic acid covers up the presence of adulterants unless they are present in very large proportions when the color produced is a yellow or orange instead of the ruby or purple-red.

Whenever the results obtained with these tests indicated impurity special examinations were made to decide the adulterant or substitute.

The following is a tabulated statement of the examination of the 182 samples of phenacetin thus obtained.

* The presence of acetanilid is indicated by a decided precipitate, which becomes crystalline. Antipyrine gives a turbidity and an orange color to the solution separating out as an orange-colored amorphous resinous precipitate adhering to the bottom of the tube.

| Number and Location. | Physical Character of Samples. | Color with Nitric Acid. | Melting Point. | Reaction with Bromine Water. | Reaction with Sodium Peroxide and Solution of Chlorinated Soda. | Conclusion. |
|---|---|---|---|---|---|---|
| Atlanta, Ga. | | | | | | |
| 1 | Crystalline powder, tasteless. | Yellow. | 134° C. | No precipitate. | No color reaction. | Phenacetin. |
| 2 | Fine powder, tasteless. | " | 135° C. | " | " | " |
| 3 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 4 | Crystalline powder. tasteless. | " | 135° C. | " | " | " |
| 5 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 6 | Micaceous crystals. | " | 135° C. | " | " | " |
| 7 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 8 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 9 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 10 | Fine powder, taste suspicious. | " | 130° C. | Faint precipitate after standing. | Pink color reaction. | Phenacetin [1] with trace acetanilid. |
| St. Louis. | | | | | | |
| 11 | Fine powder, taste suspicious. | " | Soft 94°, Fuses 104°, Complete 109° C. | Decided precipitate. | Distinct onion red. | Phenacetin and acetanilid. |
| 12 | Fine powder, tasteless. | " | 134° C. | No precipitate. | No color reaction. | Phenacetin. |
| 13 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 14 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 15 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 16 | Fine powder, tasteless. | " | 133° C. | " | " | " |
| 17 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 18 | Fine powder, tasteless. | " | 133.5° C. | " | " | " |
| Detroit. | | | | | | |
| 19 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 20 | Fine powder, taste suspicious. | " | Soft 91°, Fuses 92° Complete 94° C. | Decided precipitate. | Pink color. | Mixture of acetanilid and phenacetin. |
| 21 | Moist powder, staining paper, taste disagreeable. | Colorless. | Soft 102°, Partly melts 110°, and becomes brown, a portion not melting at 170° C. | Copious precipitate. | [2] | Acetanilid and sodium salicylate mixture. |
| 22 | Fine powder, tasteless. | Yellow. | 134° C. | No precipitate. | No color reaction. | Phenacetin. |
| 23 | Crystals, tasteless. | " | 134.5° C. | " | " | " |
| 24 | Fine powder, taste suspicious. | Colorless. | 113° C. | Copious precipitate. | Purple red. | Acetanilid. |

[1] This sample probably contained about 3 or 4 per cent. of acetanilid, and .1 Gm. distilled in a test-tube with 2 Cc. solution of sodium hydroxide and collecting the first two drops into 2 Cc. of Labarraque's Solution gave a purple coloration, confirming the sodium peroxide reaction, and other tests.

[2] On adding water to the mixture of .1 Gm. No. 21 and .1 Gm. sodium peroxide, the mixture took fire, the deflagation being sufficient to burst the tube, and this test could not be applied. .1 Gm. boiled with sodium hydroxide and to the cooled liquid 5 Cc of Labarraque's Solution added with the production of a purple changing to a deep brown cloudy liquid promptly. .1 Gm. dissolved entirely in 10 Cc. of water with the solution slightly alkaline, and the presence of sodium salicylate was shown by usual tests.

| Number and Location. | Physical Character of Samples. | Color with Nitric Acid. | Melting Point. | Reaction with Bromine Water. | Reaction with Sodium Peroxide and Solution of Chlorinated Soda. | Conclusion. |
|---|---|---|---|---|---|---|
| Detroit. | | | | | | |
| 25 | Crystalline powder, tasteless. | Yellow. | 133.5° C. | No precipitate. | No color reaction. | Phenacetin. |
| 26 | Crystals, tasteless. | " | 134° C. | " | " | " |
| 27 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 28 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 29 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 30 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 31 | Powder, tasteless. | " | 133° C. | " | " | " |
| 32 | Crystalline powder, tasteless. | " | 133.5° C. | " | " | " |
| 33 | Hard crystals, tasteless. | " | 134.5° C. | " | " | " |
| 34 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 35 | White powder, tasteless. | " | 133° C. | " | " | " |
| 36 | Fine powder, tasteless. | " | 133.5° C. | " | " | " |
| 37 | Fine powder, tasteless. | " | 133° C. | " | " | " |
| 38 | Fine powder, taste slightly bitter.[3] | " | 132.5° C. | " | " | " |
| 39 | Fine powder, tasteless. | " | 134.5° C. | " | " | " |
| 40 | Fine powder, tasteless. | " | 133° C. | " | " | " |
| 41 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 42 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 43 | Crystalline powder, tasteless. | " | 133.5° C. | " | " | " |
| 44 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 45 | Fine powder, tasteless. | " | 133° C. | " | " | " |
| 46 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 47 | Fine powder, tasteless. | " | 133.5° C. | " | " | " |
| 48 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 49 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 50 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 51 | Crystalline powder, tasteless. | " | 133° C. | " | " | " |
| 52 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 53 | Crystals, tasteless. | " | 135° C. | " | " | " |
| 54 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 55 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 56 | Fine powder, tasteless. | " | 134.5° C. | " | " | " |
| 57 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 58 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |

[3] At first, I suspected that the bitter taste noticed in this sample was due to either antipyrine or caffeine, but was not able to confirm this by tests, and was compelled to attribute this to some accidental contamination possibly introduced in the powdering.

| Number and Location. | Physical Character of Samples. | Color with Nitric Acid. | Melting Point. | Reaction with Bromine Water. | Reaction with Sodium Peroxide and Solution of Chlorinated Soda. | Conclusion. |
|---|---|---|---|---|---|---|
| New York. | | | | | | |
| 59 | Crystalline powder, tasteless. | Yellow | 134.5° C. | No precipitate. | No color reaction. | Phenacetin. |
| 60 | Crystalline powder, tasteless. | " | 133.5° C. | " | " | " |
| 61 | Fine powder, tasteless. | " | 133° C. | " | " | " |
| 62 | Crystals tasteless. | " | 134° C. | " | " | " |
| 63 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 64 | Crystalline powder, tasteless. | " | 133.5° C. | " | " | " |
| 65 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 66 | Fine powder, tasteless. | " | 133.5° C. | " | " | " |
| 67 | Crystalline powder, tasteless. | " | 133° C. | " | " | " |
| 68 | Fine powder, faint taste. | " | 127° C. | Faint precipitate after standing. | Pink. | Phenacetin containing a small percentage of acetanilid. |
| 69 | Fine powder, decided taste. | " | Soft 104° Fuses 110°, Entirely 116° C. | Decided precipitate. | " | Mixture of acetanilid and antipyrine.[4] |
| 70 | Crystalline powder, tasteless. | " | 134.5° C. | No precipitate. | No color reaction. | Phenacetin. |
| 71 | Fine powder, tasteless. | " | 133.5° C. | " | " | " |
| 72 | Fine powder, taste suspicious. | " | 118° C. | Decided precipitate. | Pink. | Mixture of phenacetin and acetanilid. |
| 73 | Crystalline powder, tasteless. | " | 134.5° C. | No precipitate. | No color reaction. | Phenacetin. |
| 74 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 75 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 76 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 77 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 78 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 79 | Crystalline powder. tasteless. | " | 135° C. | " | " | " |
| 80 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 81 | Crystalline powder, tasteless. | " | 133° C. | " | " | " |
| 82 | Crystalline powder, taste suspicious. | " | Soft 94°, Fuses 98°, Complete 110° C. | Copious precipitate. | Orange red. | Mixture of phenacetin and acetanilid. |
| 83 | Crystalline powder, faint taste. | " | 130° C. | No precipitate. | Pink (faint). | Phenacetin with trace of acetanilid. |
| 84 | Crystalline powder, faint taste. | " | 130° C. | " | " | " |
| 85 | Fine powder, tasteless. | " | 132° C. | " | No color reaction. | Phenacetin. |
| 86 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |

[4] The presence of antipyrine in this sample was confirmed by the crimson color with warm nitric acid and a green color produced with sodium nitrite on the addition of a few drops of sulphuric acid. The melting point being slightly higher than that of acetanilid or antipyrine, led me to suspect that it contained at least some phenacetin, but as I failed to obtain the color reaction with chromic acid it must have been present in but small amount. The color with nitric acid was readily attributed to the antipyrine present.

| Number and Location. | Physical Character of Samples. | Color with Nitric Acid. | Melting Point. | Reaction with Bromine Water. | Reaction with Sodium Peroxide and Solution of Chlorinated Soda. | Conclusion. |
|---|---|---|---|---|---|---|
| New York. | | | | | | |
| 87 | Crystalline powder, tasteless. | Yellow. | 134.5° C. | No precipitate. | No color reaction. | Phenacetin. |
| 88 | Fine powder, tasteless. | " | 135° C. | " | " | " |
| 89 | Fine powder, tasteless. | " | 134.5° C. | " | " | " |
| 90 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 91 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 92 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 93 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 94 | Fine powder, tasteless. | " | 134.5° C. | " | " | " |
| 95 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 96 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 97 | Fine powder, tasteless. | " | 135° C. | " | " | " |
| 98 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 99 | Crystals, tasteless. | " | 134° C. | " | " | " |
| 100 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 101 | Crystalline powder, slightly bitter and suspicious. | " | Soft 100°, Fuses 113°, Completely 120° C. | Distinct precipitate. | Pink. | Mixture of phenacetin and acetanilid. |
| 102 | Crystalline powder, tasteless. | " | 134° C. | No precipitate. | No color reaction. | Phenacetin. |
| 103 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 104 | Powder, tasteless. | " | 134° C. | " | " | " |
| 105 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 106 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 107 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 108 | Fine powder, tasteless. | " | 135° C. | " | " | " |
| 109 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 110 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 111 | Fine powder, tasteless. | " | 134.5° C. | " | " | " |
| 112 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 113 | Crystalline powder, taste suspicious. | " | Soft 94°, Entirely fused 110° C. | Copious precipitate. | Pink. | Mixture of phenacetin and acetanilid. |
| 114 | Powder, taste suspicious. | " | 120° C. | Precipitate after standing. | " | Mixture of phenacetin and acetanilid. |
| 115 | Crystalline powder, tasteless. | " | 134.5° C. | No precipitate. | No color reaction. | Phenacetin. |
| 116 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 117 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 118 | Fine powder, decided taste. | " | Soft 94°, Melts 105°, Complete 115° C. | Copious precipitate. | Pink color. | Mixture of phenacetin and acetanilid. |

| Number and Location. | Physical Character of Samples. | Color with Nitric Acid. | Melting Point. | Reaction with Bromine Water. | Reaction with Sodium Peroxide and Solution of Chlorinated Soda. | Conclusion. |
|---|---|---|---|---|---|---|
| Philadelphia. | | | | | | |
| 119 | Fine powder, tasteless. | Yellow. | 134.5° C. | No precipitate. | No color reaction. | Phenacetin. |
| 120 | Fine powder, tasteless. | " | 133.5° C. | " | " | " |
| 121 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 122 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 123 | Crystals, tastes warming. | Colorless. | 113° C. | Copious precipitate. | Brown-red. | Acetanilid. |
| 124 | Crystalline powder, tasteless. | Yellow. | 134° C. | No precipitate. | No color reaction. | Phenacetin. |
| 125 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 126 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 127 | Powder, tasteless. | " | 134° C. | " | " | " |
| 128 | Crystals, tasteless. | " | 134° C. | " | " | " |
| Newark, N. J. | | | | | | |
| 129 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 130 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 131 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 132 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 133 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 134 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 135 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 136 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 137 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| Baltimore. | | | | | | |
| 138 | Fine powder, tasteless. | " | 134° C. | " | " | " |
| 139 | Fine powder, taste soda-like and warming. | Colorless and effervescing. | A portion liquid 113° balance not melted at 150° C. | Copious precipitate. | [5] | Acetanilid and sodium bicarbonate. |
| 140 | Crystalline powder, taste decided. | Yellow. | Soft 94°, Melts 96°, Completely 107° C. | Decided precipitate. | Pink color. | Mixture of phenacetin and acetanilid. |
| 141 | Crystals, tasteless. | " | 135° C. | No precipitate. | No color reaction. | Phenacetin. |
| 142 | Crystalline powder, tasteless. | " | 134° C. | " | " | " |
| 143 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 144 | Crystalline powder, taste suspicious. | " | Soft 88°, Fuses 92°, Completely 100° C. | Decided precipitate. | Pink-red. | Mixture of phenacetin and acetanilid. |
| 145 | Powder, taste suspicious. | " | Soft 122°, Fuses 124°, Completely 128° C. | Slight precipitate. | Pink. | Phenacetin and acetanilid. |

[5] The envelope enclosing this purchased sample contained the following wording, "we will always use fresh medicines in your prescriptions and prices will be honest."

| Number and Location. | Physical Character of Samples. | Color with Nitric Acid. | Melting Point. | Reaction with Bromine Water. | Reaction with Sodium Peroxide and Solution of Chlorinated Soda. | Conclusion. |
|---|---|---|---|---|---|---|
| Baltimore. | | | | | | |
| 146 | Crystalline powder, tasteless. | Yellow. | 134° C. | No precipitate. | No color reaction. | Phenacetin. |
| 147 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 148 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 149 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 150 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 151 | Crystalline powder, taste suspicious. | " | Soft 100°, Melts 105°, Complete 118° C. | Decided precipitate. | Pink. | Mixture of phenacetin and acetanilid. |
| 152 | Crystalline powder, taste suspicious. | " | Melts 95°, Completely 105° C. | Copious precipitate. | Red. | " |
| 153 | Fine powder, tasteless. | " | 134.5° C. | No precipitate. | No color reaction. | Phenacetin. |
| 154 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 155 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 156 | Fine powder, tasteless, | " | 134.5° C. | " | " | " |
| 157 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 158 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 159 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 160 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 161 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |
| 162 | Powder, taste suspicious. | " | Soft 92°, Melts completely 98° C. | Copious precipitate. | Red. | Mixture of phenacetin and acetanilid. |
| 163 | Powder, taste suspicious. | " | Soft 115°, Completely 126° C. | Decided precipitate. | Pink. | " |
| 164 | Powder, suspicious. | " | Soft 120°, Completely 130° C. | Faint precipitate. | " | " |
| 165 | Fine powder, soft and faint bitter taste. | Colorless. | — | No precipitate. | No color reaction. | Boric Acid.[6] |
| 166 | Fine powder, taste suspicious. | Yellow. | Soft 120°, Fuses 122°, Completely 126° C. | Slight precipitate. | Pink color. | Mixture of phenacetin and acetanilid.[1] |
| 167 | Very fine powder, taste suspicious. | " | Soft 122°, Fuses 126°, Completely 130° C. | " | " | Phenacetin with a trace of acetanilid.[1] |
| 168 | Crystalline powder, taste bitter and suspicious. | " | Soft 90°, Fuses 92°, Completely 94° C. | Copious precipitate. | " | Mixture of acetanilid and phenacetin. |
| 169 | Crystalline powder, tasteless. | " | 135° C. | No precipitate. | No color reaction. | Phenacetin. |
| 170 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |

[6] .1 Gm. of this powder dissolved entirely in 10 Cc. hot water remaining clear on cooling. The solution was acid to litmus paper. The salt failed to give isonitrile test. On heating on a platinum loop a clear bead was obtained, then fusing, and leaving practically no residue. The flame of the burner was colored green indicating boric acid, which was confirmed by the alcohol and turmeric tests.

| Number and Location. | Physical Character of Samples. | Color with Nitric Acid. | Melting Point. | Reaction with Bromine Water. | Reaction with Sodium Peroxide and Solution of Chlorinated Soda. | Conclusion. |
|---|---|---|---|---|---|---|
| Baltimore. | | | | | | |
| 171 | Crystalline powder, tasteless. | Yellow. | 135° C. | No precipitate. | No color reaction. | Phenacetin. |
| 172 | Fine powder, taste very suspicious. | Faint yellow. | Soft 88°, Fuses 90°, Completely 96° C. | Copious precipitate. | Red. | Mixture of acetanilid and phenacetin. |
| 173 | Very fine powder, tasteless. | Yellow. | 134.5° C. | No precipitate. | No color reaction. | Phenacetin. |
| 174 | Crystalline powder. taste suspicious. | " | Soft 94°, Fuses 96°, Completely 100° C. | Copious precipitate. | Pink. | Mixture of acetanilid and phenacetin. |
| 175 | Micaceous crystals, taste very suspicious. | Colorless. | 113° C. | " | Brown-red. | Acetanilid. |
| 176 | Powder, taste suspicious. | Yellow. | Soft 100°, Fuses 108°, Completely 116° C. | Decided precipitate. | Faint reaction. | Mixture of phenacetin and acetanilid. |
| 177 | Crystalline powder, tasteless. | " | 135° C. | No precipitate. | No color reaction. | Phenacetin. |
| 178 | Powder, tasteless. | " | 134.5° C. | " | " | " |
| 179 | Fine powder, taste of soda. | Yellow color and effervescence. | Liquid at 135° C., and a portion not dissolved. | " | " | Phenacetin and sodium bicarbonate. |
| 180 | Powder, tasteless. | Yellow. | 135° C. | " | " | Phenacetin. |
| 181 | Crystalline powder, tasteless. | " | 134.5° C. | " | " | " |
| 182 | Crystalline powder, tasteless. | " | 135° C. | " | " | " |

A review of the writer's examination of 182 commercial samples shows that of ten samples from Atlanta, nine were pure, and one contained only a slight trace of acetanilid. Of the eight samples from St. Louis, one was grossly adulterated and seven were pure. Of the forty from Detroit, thirty-seven were pure and three grossly adulterated. Of the sixty from New York, fifty were pure, seven grossly adulterated, and three contained traces of adulterant. Of the ten from Philadelphia, nine were pure and one was an entire sophistication. Of the nine from Newark, all were above suspicion. Baltimore shows up but poorly; out of forty-five samples, but twenty-seven were pure and fifteen were grossly adulterated, and three contained small amounts of admixture.

The total of these examinations exhibits 148 pure, 27 grossly adulterated and seven slightly contaminated, or, on a percentage basis, 81 per cent. were pure, 15 per cent. grossly adulterated, and 4 per cent. contaminated to a slight extent, that might be explained as accidental.

While most of these samples were dispensed in neat envelopes, properly labeled, and enclosing the powder in parchment, waxed or other good powder-papers, some few were supplied in common counter-paper, torn in

jagged and uneven shapes, or enclosed in envelopes, with name badly written in pencil, and several even without envelopes. While these few exhibitions of slovenliness are passed without further comment, we must protest against the rank carelessness exhibited in weighing. Envelopes all marked as containing "10 grains of phenacetin" showed the following variations: No. 20 weighed 4 grains; Nos. 57, 83 and 113, each 6 grains; Nos. 19 and and 101, each 12 grains; No. 118, 13 grains; No. 26 and No. 89, each 14½ grains; No. 33, 15 grains, and No. 35, 20 grains.

Mr. Beringer received the applause of his auditors, and the Chair stated that, without objection, the papers would take the usual course.

The Chair then called upon Mr. Kebler to present a short paper he had prepared upon the subject of phenacetin*, which he did, Mr. Kebler also receiving the applause of the Section.

The Chair stated that this paper, also, would take the usual course, without objection.

MR. PAYNE: I should like to ask Mr. Kebler a question. I believe he stated that this matter was investigated and it was found that the patent was valid. Now I want to ask if that was an actual examination of the legality of the patent. I have been questioned a good deal as to whether that feature of the case could be actually sustained. It has been sustained by the courts, I know, in one decision. I want to know how thoroughly Mr. Kebler went into this question.

MR. KEBLER: I have taken legal advice on it, and have gone over the decision of the judge that had the matter in hand; and I have personally had considerable experience in commercial life, and from my experience I do not believe you can do anything with that patent.

MR. PAYNE: The reason I speak of that, you remember what was said by one of our members in regard to that patent last year, at one of the sessions.

MR. LOWE: In Pennsylvania a dealer in phenacetin was arrested, and the Pennsylvania Association came to his financial support, and Professor Sadtler, of the Philadelphia College of Pharmacy, was retained as chemical counsel. This man's name was Maurer, I believe, and he was an importer of phenacetin from Canada, I think—or, at any rate, he got it from some source other than from the German manufacturers through their American agent. The phenacetin people brought suit against him in the United States District Court, and the defendant lost the case below; but Dr. Sadtler always thought if we had had the money to appeal it, and to have gotten the necessary literature—which can be had in Germany—showing the priority of process there over the regular makers, the patent could have been broken down in the higher court. In a similar case, I think, Meyer Brothers, of St. Louis, were attacked by the same parties for importing their phenacetin, or securing it cut of the usual channel; but that suit was compromised. Meyer Brothers had the money to fight it through, but the phenacetin people agreed to drop it if they would quit the importation of the irregular goods, and they agreed to do so. That is my understanding of that case.

MR. GOOD: That is news to me—what M. Lowe says in regard to the Meyer Brothers

* This paper, not being obtainable at the time of going to press, will be printed with papers read by title, at end of Minutes of this Section.—GEN'L SECRETARY.

Drug Company, of St. Louis, in this connection. I would like to ask Mr. Kebler if he knows how long this patent has to run.

MR. KEBLER: Between two and three years, I think.

MR. BERINGER: The patent expires in March, 1906.

MR. LOWE: I think the question with Meyer Brothers was what it would cost to sustain their point. They probably considered it in that light, and concluded it was just as wise to drop the thing as to fight it through. But they were in a position to fight it through, so they were not attacked any longer.

MR. GOOD: If they had been in such a position as that, they would certainly, I think, have handled the low-priced phenacetin.

MR. MAYO: As I understand Mr. Lowe, the matter was dropped by mutual consent.

MR. LOWE: Yes, sir.

MR. CLIFFE: I want to say that the Pennsylvania case referred to by Mr. Lowe was taken to the United States Supreme Court on a writ of *certiorari*, which was denied. It is certain that no relief can come from the courts in the case of phenacetin.

MR. M. NOLL: In the examination of impurities that Mr. Beringer has given, he gives a long list of color tests, I believe. Now, what the druggist wants to know is a test that is simple. I am satisfied that the melting-point test is first-rate, but which is generally considered the best color test?

MR. BERINGER: Either of the two methods of applying the color test produced by acetanilid upon decomposition with alkali hydroxide and adding chlorinated soda solution. The paper describes the two methods. My thought all the time was as to a simple test which the druggist could use in his store.

MR. GOOD: The color, I suppose, varies with the amount of admixture ?

MR. BERINGER: Yes, sir; that is spoken of in the paper. It is shown in this test here (proceeding to explain from his sample vials on the table before him).

MR. KEBLER: I would just like to say another word about that patent. It was shown —and literature bears it out—that phenacetin was made previous to the issuance of the patent. It was made chiefly in a laboratory way. Now the judges—and I think rightly —almost unanimously, in deciding the validity of a patent, take into consideration whether the commodity has been made in a commercial manner, or has been a good, useful product, and placed on the market for a good purpose. They do not consider the fact—in a great many cases, at least—that the product has simply been made, but not used at all. They give the patent to the man who has invented it and put it on the market in a practical way, and so as to be useful, and not where he invents it and then lets it die of disuse.

MR. HALLBERG: As I understand, there is a treaty with the German government allowing American residents to have exclusive control of certain German products for the United States, and until that can be corrected we are liable to have these same conditions with other products at any time.

MR. TODD: Relative to the validity of a patent, or whether it can be questioned because the same substance had been before discovered in a laboratory way, you recollect the very wording of the patent on that subject is, that it is a new *and useful* improve-

ment. The fact that it was discovered will not entitle it to a patent, nor can the original discoverer annul it. So it must not only be new, it must be worked. As Mr. Kebler has already said, it must be worked in a practical way. If it were not for the words "and useful" in our patent papers the situation would be different. In some cases, products that were discovered in a laboratory way by the French scientists fifty years ago have been granted patents in this country, not only on the process of manufacture, but on the article itself. So it would seem that a patent would be a very difficult thing to fight.

The Chair then called on Mr. Puckner to read a paper on Nux Vomica assay, which he did, being applauded upon his effort.

## NUX VOMICA ASSAY.

W. A. PUCKNER, CHICAGO.

Some time ago I published (Pharm. Rev., 16, 180, and 20, 457), a method for the assay of belladonna leaves. It was a modification of the method of Keller, and directed that the maceration of the drug with the ammoniacal chloroform-ether mixture as directed by Keller, be followed by percolation, attempting thereby to exhaust the drug completely, and thus avoid the taking of an aliquot part of the chloroform-ether. I at that time expressed the opinion that in the assay of such drugs as nux vomica, ipecac, etc., where the amount of solvent in relation to drug and water used is large, the error introduced through the use of an aliquot part will be small, and may be neglected. And I proposed this modification for such drugs as belladonna leaves, henbane leaves and stramonium leaves, where the error would be greater on account of the small amount of alkaloid contained in the drug, its greater bulk and absorbent power, the weight of drug operated on must be increased, as also the water to be added, while a corresponding increase of chloroform-ether would render the process cumbersome.

Since then I have been gradually eliminating all aliquot parts from routine assay methods, less to avoid the error incidental to the taking of the aliquot portion, than as a matter of convenience. Thus, by eliminating the aliquot part the use of dry measuring vessels and their subsequent cleaning is avoided, the loss of volatile solvent by evaporation is of no consequence, and due care may be taken to obtain the chloroform-ether quite clear, and thereby avoid many a persistent emulsion. Also the time of maceration may be reduced to an hour or half an hour, while in methods where aliquot parts are taken, three, six, or even twelve hours maceration with frequent or even continuous agitation is directed.

Below are given some experiments relative to the extraction of alkaloids from nux vomica which may be of interest to those engaged in similar work. These results show that the aliquot part method gives correct results, apparently through a compensation of errors, that an hour's maceration and subsequent percolation may well be substituted, and that alcohol

should here be added to the light chloroform-ether mixture usually used in the Keller method, since its addition facilitates the extraction of the alkaloids, and also prevents the formation of emulsions in subsequent steps of the determination.

A. To 5 Gm. powdered drug were added 40 Cc. ether, 10 Cc. chloroform, 2 Cc. ammonia water, and the mixture shaken occasionally one hour. It was then transferred to a small percolator, the percolate received in a separator; when the menstruum had all passed through, the drug was packed down and exhausted with a further 50 Cc. of the chloroform-ether. The chloroform-ether solution of the alkaloids was next extracted with 10, 10 and 10 Cc. normal sulphuric acid.

To the acid extractions a drop of cochineal T. S. was added, then an excess of ammonia water, and then the alkaloid abstracted with 10, 10, 10 Cc. chloroform. After the evaporation of the chloroform the alkaloidal residue was titrated with decinormal acid, cochineal being used as an indicator. In these determinations the chloroform extractions took much time, while shaking with chloroform did not produce a condition which could be called an emulsion, yet each time an hour or more often elapsed before the chloroform would separate completely and could be drawn off. In four determinations the alkaloidal residue so obtained required a) 3.31, b) 3.49, c) 3.41, and d) 3.49 Cc. of the decinormal acid.

B, a. These determinations were carried out as those in A in every way except that the drug was macerated with 50 Cc., and later percolated with 80 Cc. of a mixture obtained by mixing 7 Cc. alcohol, 23 Cc. chloroform, and 70 Cc. ether. Here all separations occurred most promptly, and all liquids drawn off were perfectly clear. In four determinations the alkaloidal residue required a) 3.49, b) 3.53, c) 3.56, and 3.47 Cc. of decinormal acid.

B, b. Proceeding as in B, a, except that the time of maceration was extended to two hours, there was required a) 3.46, b) 3.47 Cc. decinormal acid.

B, c. Again proceeding as in B, a, but macerating two hours, decanting the clear liquid to the percolator, macerating the drug with a further 50 Cc. for two hours, then transferring all to the percolator, and then percolating with further 25 Cc. In this way there were required a) 3.54 and 3.50 Cc. decinormal acid.

C. To 10 Gm. drug were added 100 Cc. chloroform-ether, obtained by mixing one volume of chloroform with four volumes of ether and 4 Cc. ammonia water, the mixture shaken frequently for three hours, allowed to stand over night, shaken again, the drug allowed to subside and then decanted through cotton to obtain exactly 50 Cc. This aliquot part (part 1) was transferred to a separator, the flask rinsed with a little chloroform-ether, then the alkaloid extracted and determined as in A. The remaining chloroform-ether and the drug was now transferred to the perco-

lator, through which the aliquot part had been decanted, and further 75 Cc. chloroform-ether used to complete the extraction. From this liquid (part 2) the alkaloid was again obtained as in A. Finally the marc was dried and then extracted according to B. The result was:

Part 1, 3.15 Cc. Part 2, 3.38 Cc. Part 3, 0.18 Cc.

Here again, as in A, the extraction with chloroform consumed much time.

D. Here the procedure in C was followed, except that to 10 Gm. drug was added 100 Cc. Prollius mixture (70 Cc. ether, 23 Cc. chloroform, and 7 Cc. alcohol were measured into a flask, allowed to stand until cooled to room temperature, then 3 Cc. ammonia water added, shaken violently, and while the ammonia water was in suspension 100 Cc. measured out and added to the drug). After decanting the aliquot portion, the exhaustion was completed with 100 Cc. of menstruum consisting of 70 Cc. ether, 23 Cc. chloroform and 7 Cc. alcohol.

For three determinations the results are:

| | | | |
|---|---|---|---|
| a. | Part 1. 3.51 Cc. | Part 2. 3.36 Cc. | Part 3. 0.15 Cc. |
| b. | 3.49 Cc. | 3.34 Cc. | 0.20 Cc. |
| c. | 3.45 Cc. | 3.36 Cc, | 0.08 Cc. |

If the experiments detailed under B may be taken to show a practically complete exhaustion, then it may also be accepted that the aliquot part (part 1) in D, apparently through an accidental compensation of inaccuracies, gives equally correct results. In choosing one or the other procedure when extracting nux vomica, it should be borne in mind that in the aliquot part method, care must be exercised to add the exact volume of the ether-chloroform-alcohol-ammonia water mixture, and later to avoid all evaperation when obtaining the aliquot part. This is done away with in B, which, however, takes more time, owing to the percolation directed.

Below are given some determinations made on samples submitted from time to time, which show an exceptional concordance between the results obtained according to B, a, and the aliquot part (part 1) of C.

| Cc. of $\frac{N}{10}$ $H_2SO_4$ required for 5 Gm. a/c to Method B, a. | Cc. of $\frac{N}{10}$ $H_2SO_4$ required for the aliquot part representing 5 Gm. drug a/c to Method C. |
|---|---|
| 1. a) 3.93 Cc. b) 3.90 | a) 3.87 Cc. |
| 2. a) 2.80 Cc. b) 2.82 c) 2.77 Cc. | a) 3.03 Cc. b) 2.81 Cc. |
| 3. a) 2.48 Cc. b) 2.49 | a) 2.39 Cc. |
| 4. a) 4.24 Cc. b) 4.23 | a) 4.19 Cc. |
| 5. a) 2.81 Cc. b) 2.75 | a) 2.81 Cc. |

The Chair stated that, without objection, the paper would take the usual course.

MR. SAYRE: Mr. Chairman, before we adjourn I would like to ask if it is not possible for us to have a meeting this afternoon? We have thirty-five papers, and I think possibly we could get an hour or two then.

Mr. Mayo stated that in view of the announcement that had been made that the carriage-drive around the island might be taken any time, he thought it would be well to utilize the afternoon by having an adjourned session, and he therefore moved that when the Section adjourn it be to three o'clock.

Mr. Hallberg raised the question as to whether the programme could thus be interfered with, in justice to those members who might be absent from the adjourned session on the strength of the printed programme. Mr. Sayre said the question was, if it were possible to get through with thirty-five papers otherwise. Mr. Hallberg thought so, if they were presented by the writers in abstract form, as the gentleman from Chicago presented his.

The motion to meet in adjourned session was then put to a vote and carried.

On motion of Mr. Mayo the Section then adjourned.

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ADJOURNED SESSION—WEDNESDAY AFTERNOON, AUGUST 5, 1903.

The adjourned session of the Section on Scientific Papers (a continuation of the first session) was called to order in the Casino at 3 : 30 p. m.

The Chair called on Mr. Eberle to read a paper he had prepared on Mezquit. The gentleman presented the paper in abstract, the full text being as follows:

## MEZQUIT.

BY E. G. EBERLE, DALLAS, TEX.

The Mezquit is a tree or shrub, in accordance with the favors nature bestows upon it, and aided by the hands of man. Coulter describes the Mezquit as a shrub or tree, often armed with axillary spinse or spinescent stipules, with bipinnate leaves, one or two pairs of pinnæ, usually numerous small leaflets, small greenish flowers in cylindrical or globose axillary pedunculate spikes and a linear pod, which is compressed or terete, straight or falcate, or twisted, coriaceous and indehiscent, and with thick partitions between the seeds. There are said to be 20 species, and applying distinguishing characteristics mentioned, we have three in Texas, viz.: Prosopis juliflora, with an elongated straight or falcate pod; Prosopis pubescens, with a thick twisted pod; and the Prosopis cinerascens, with a similar fruit but much smaller leaflets.

Schwartz describes the habitat of the Mezquit as follows: Extending from "the southern border of the Indian Territory, Northern and Western Texas (the eastern limit defined by a line from the intersection of latitude

37° with the 100th meridian to Dallas; thence south to the Colorado River, and southwestward within 20 or 30 miles of the gulf, which is reached near the mouth of the Rio Grande River) into Northern Mexico. Also from the southern borders of Colorado and Utah, through New Mexico, Arizona, and Southern Nevada to Southern California, the western limit defined by a line from Tejan Pass over Los Angeles to San Pedro; in lower California, western South America (Andean region to Chile), Argentina and Southern Brazil and Jamaica."

I know, however, that it grows at least fifty miles east of Dallas; in fact, it is almost co-extensive with Texas prairies.

The name prosopis is Greek, meaning a face. The name under which it is commonly known, Mezquit, is also spelled by substituting an s for the z, and even displacing the qu with the letter k. The variety pubescens is known also as Tomillo and Screw-bean.

At the beginning I noted that the various forms or developments were due to surrounding conditions, and these are so distinctive that they tempt the botanist to divide what is evidently the same plant into varieties. In localities where the soil is rich and deep, the roots penetrate to a remarkable depth, and if the region is comparatively free from high winds it attains to a height of fifty feet or even more; in portions visited by frequent heavy winds it becomes a spreading tree. The trees have very great resemblance to fruit trees, and I remember my astonishment and embarrassment afterwards when I mistook a grove for an orchard in a region very sparingly inhabited. In regions where heavy winds are still more prevalent the tree grows along the ground and forms a thicket, and where the sand blows frequently, as snow does in winter in the Northern States, it becomes almost covered and is evidenced by the foliage peering through the sand mound. So it will be seen that the Mezquit adapts itself to the conditions which surround it. The tree grown from the seed is hardy; the rapidity of its growth is always slow, naturally depending largely upon the moisture, which, in a great portion of the section in which the Mezquit rules supreme, is not abundant.

Dr. Havard makes the statement that a trunk seven or eight inches in diameter indicates a tree about thirty years old, and one of about twelve inches in the neighborhood of seventy-five years. The life of a tree underground is estimated at about thirty-five years, while above ground they certainly attain the age of 100 years, trees having attained a diameter of twenty inches. The wood shades in color from a reddish brown to a light yellow, very hard, dense and durable. Its specific gravity is .7652. As a fuel it is equal to hickory. It yields an excellent charcoal. The yield of ash varies from 3½ to 5 per cent., and I quote from Bulletin No. 13, Arizona Agricultural Experiment Station, its percentage composition: "Potash, 3.49; soda, .15; lime, 28.98; phosphoric acid, 68. The wood contains about 10 per cent. of tannins.

The wood is the fuel of a large portion of the section wherein it grows, and in some localities the exclusive source. It is surprising the yield of wood derived from the underground growth of the mezquit to which I have referred; sometimes such a mound, holding only one plant, furnishes several cords of wood. It is a novel sight to those not accustomed to see it, in our Western city, El Paso, the Mexican coming to market with his burro loaded with two bundles of mezquit, which he has dug out of the ground. On account of the durability of the wood in the presence of moisture, as well as necessity, it is largely used for fencing, foundations for buildings and railroad ties. The bark and wood are used both for tanning and dyeing. A decoction of the former is used as an astringent, and by the addition of a salt a purgative draught is made and used by the natives.

In the arid region in which the tree grows it is a blessing in more respects than one. It furnishes a most delightful shade, due to the fact that the leaves, which are suspended upon a small stem, and the flexibility of the branches, permit the free passage of the breeze without affecting the shade. The leaves are eaten by cattle when no other food is to be had, but they cause the milk to become bitter. The composition of the leaves is very much the same as alfalfa hay, the amount of tannin, however—about 6 per cent.—make them objectionable for fodder.

Under favorable conditions the mezquit produces two crops of legumes. These pods hang in clusters of from five to ten, and are from 10 to 24 Cm. long, about 8 Mm. wide and 12 Mm. thick. When ripe they are of yellowish color, speckled with red, and have a fragrant, sweetish taste. It is this yield of the tree that adds to its worth, for upon them the native and his stock largely subsist, and the American stockman has learned to appreciate their value for fodder. The pods constitute about three-fourths of the weight and the seeds one-fourth; both are very nutritious, and preferred by stockmen to oats and barley. In order to utilize the seeds, they must be ground into meal. Protein is present in very much larger proportion than in corn, and fat and carbohydrates in about the same proportion. Both cane and grape sugar are present in variable quantities, ranging from 10 to nearly 25 per cent., the former being largely in excess. Not only does the mezquit bean supply the wants of the native for his stock, but also his own and that of his family; in fact, in some sections they constitute his food and luxury. The pods are ground into meal, baked into a bread which does not mould or harden for months, into cakes, and also served in the form of mush by boiling with water. The seeds are parched, and then used in place of coffee. They are also used in making a beverage, by allowing an infusion of the pods to ferment; this is known as tiswin. The olla basketry with which some of you are acquainted are jugs used for making tiswin. A delicacy is made of the meal, similar to our custards, which is flavored to suit with fruits, vanilla or chocolate, and known as atole.

Medicinally, a decoction is used for kidney and bladder affections.

The leaflets are used by the natives in the form of a poultice to allay inflammation. Internally an infusion of the leaves is used for fevers. They are also used by the Indians for tattooing. The skin is punctured with the spines, the leaves moistened and rubbed over the surface under treatment.

The flowers of the mezquit yield, through the intervention of the industrious bees, a very excellent quality of honey.

Pharmaceutically we are somewhat interested in a gum which exudes through the bark of this very interesting plant, and forms in tears of various rounded forms. It resembles certain varieties of gum-arabic, seldom being perfectly white, with a tendency from an amber to a more or less brownish color. It differs from gum-arabic in not being precipitated with lead subacetate, ferric chloride, and is not coagulated by sodium borate. The gum has about the same solubility as acacia and, like it, its solution is slightly acid. Miss Virginia Brookes, of Waelder, Texas, reports the following composition: Arabin, 84.967; Bassorin, .206; foreign matter, .236; ash, 3.000; water, 11.640, and its ultimate composition, obtained by a combustion of the carefully-dried gum in oxygen—first experiment: Carbon, 43.63; hydrogen, 6.11; oxygen, 47.26; ash, 3. Second experiment: Carbon, 43.10; hydrogen, 6.50; oxygen, 47.40; ash, 3. I would state the amount of Bassorin in the gum seems to vary. The allusion so far made is to the gum which exudes from the branches. This can replace gum-arabic for all purposes that the latter is used for and in which the color is no objection. It makes a good mucilage; the taste reminds one naturally of mucillage of acacia. It is excellent—if anything, better than acacia—for emulsions. I am told that the Acacia Farnesiana, which grows from San Antonio to the Gulf coast and the Lower Rio Grande, yields a gum identical with acacia. By notation, I wish to state that about ten varieties of acacia grow in Texas.

In Mexico exceptional medicinal qualities are ascribed to mezquit gum, and pharmacies are required by law to keep it in stock. The principal use for it medicinally, as far as I have been able to learn, is for certain throat affections. The gum exudes during July and August, and the most favorable time for collection is during the latter part of August. In one section of the State it is only gathered for individual use; neither do I believe that very large amounts are gathered anywhere at the present time. In 1872, it is stated that 24,000 pounds were collected, half of this amount coming from Texas, according to the report of the United States Commissioner of Agriculture. It is said to make very satisfactory gum-drops, and is to some extent employed in laundries. By wounding the bark the yield can be very much increased. No specific amount can be stated as a yield from a tree, as the product varies with the season, shade, etc. Two kilos would be a good average. Boys gather it, receiving anywhere from 10 cents to 25

cents per pound. Under existing conditions it is difficult, therefore, to state what the probable yield or cost might be in case there was a steady demand for it. The territory, however, in which the tree flourishes is so extensive that the supply could be made to meet the demand if the industry was developed. A very impure gum, or perhaps better, dried sap, containing some gum, collects in deep cuts of the trunk and forms blackish masses, weighing often several pounds. This contains a large amount (15 to 22 per cent.) of tanning material, and is used by the Mexicans and others for dyeing and also for making ink.

To sum up the collected data, we have in the mezquit a source of valuable fuel in a region which otherwise would be lacking in this necessity. The fruit is palatable to both man and beast, and could be utilized for these purposes commercially. The gum could replace acacia partially, if the industry were developed. The so-called black gum contains a sufficient amount of tanning material to make it valuable. The suggestion of its use for inks, calico printing, dyeing, etc., is doubtless more of a thought than of merit.

The tree is a slow grower; it is not successfully transplanted, and prospers best when grown from the seed.

Mr. Eberle's presentation of his subject was applauded.

MR. BAILEY: I remember that gum being used as early as 1850, by a doctor by the name of Shumard. He was with the expedition that went with Capt. Marshall to New Mexico—they started in '49 and returned in '50. He brought some of the gum back with him. Then it was used simply as a mucilage; but it was recommended as a medicine—for its medicinal qualities—by Dr. Shumard, and also by my father, Dr. Joseph H. Bailey, who was connected with the medical corps of the Army.

MR. EBERLE: We have in Texas quite a number of varieties of acacia—amounting in number to ten, I am told by Mr. Reverchon. This particular variety yields a gum almost identical with acacia. I have not seen it. It grows principally around San Antonio and along the Rio Grande.

MR. HALLBERG: Some years ago, when gum arabic was high in price, I became interested in this mezquit gum, and had different persons down in Texas look the matter up and get some samples of the gum for me, and I prepared a mucilage of some of the fairly clear pieces, and I had this mucilage—about two ounces of it—in a glass-stoppered bottle. My assistant smeared the stopper with paraffin, because of its being a glass stopper. Possibly that is the reason why this mucilage kept for a year perfectly sweet—that is, I should not say sweet, because it has a natural acid, both of taste and odor, but it did not show any sign of decomposition for about a year's time, in a bottle placed at the ordinary temperature. I thought it might be quite an advantage, if this gum would furnish a mucilage which would keep for so long a time without fermenting, and also a mucilage which would not show a reaction when mixed with ferric chloride, borax or alcohol, as the mucilage of acacia does; and possibly on the market it might take the place of gum arabic in the process of making mucilage.

MR. EBERLE: I am satisfied if it should be desirable to develop it any amount of it can be collected. I believe the United States Dispensatory stated that 24,000 pounds of

it were collected in one year, without any special interest being taken in the gum, the greater portion of that being collected in Texas.

MR. REMINGTON: I think in all probability this is a commercial question as to the possibility of its coming into commerce, on account of the labor of collecting. The labor of collecting gum arabic in the Soudan is very cheap, and it is collected very largely. If the mezquit could be collected without the cost being too great, I have no doubt it would come in.

MR. EBERLE: We pay the boys there, incidentally, ten or twenty cents a pound for collecting it.

The chair called on Mr. Ebert to present a paper he had prepared on narcotine, and the gentleman read the following:

## "CONTRIBUTIONS TO THE PHARMACOLOGY OF NARCOTINE."

A CORRECTION BY ALBERT E. EBERT, CHICAGO.

In a paper contributed by the writer, "On the Manufacture of Deodorized Opium and Tincture," and published in the American Journal of Pharmacy, April, 1902, the following statement appears, "He believes, and has many times said both verbally and in print, that it is a mistake to remove from the deodorized tincture of opium the principle, narcotine, as it is not a noxious, but a most beneficial principle of opium; it is not narcotic, but a pure stimulant tonic, and is the very principle which prevents the depression that always occurs when morphine is administered alone. The writer has at different times administered to himself narcotine which he personally prepared and knew to be perfectly free from any of the other principles contained in opium. This pure narcotine he has taken in doses of from one to three grains every hour until a dozen or more doses were taken, and the effect has always been that of a stimulant tonic, free from narcotism."

At the Philadelphia meeting of the Association, a paper was presented to the Scientific Section, by A. C. Crawford, M. D,, and A. R. L. Dohme, Ph. D., entitled "Contributions to the Pharmacology of Narcotine," and in which were cited numerous experiments made by the authors on themselves and on animals, the results of which confirmed, in the main, the statements made by me in my published paper. Yet in the face of this, in closing their disquisition these gentlemen make the following extraordinary allegation, which appears on page 478 of vol. 50, Proceedings of the A. Ph. A., "*Effect on Man:* We have no reason to believe that small doses of narcotine are injurious. Any unpleasant action the undenarcotized tincture of opium may have is probably due to other so-called odorous principles, and it does not re-enforce the action of morphine. *We have found no evidence of the toxic effect claimed by Ebert in his paper published this month.*" (!). Now, as the writer has never claimed toxic effects for narcotine, but in fact the very opposite effects, the question arises: What do the gentlemen mean by such a false statement hurled at one who for

the past thirty-five years has been trying to establish the very facts that the authors from their experiments have inferred to be true.

MR. LYONS: I think the mistake complained of is easily explained. Any one who has had occasion to read proof much knows that "tonic" and "toxic" are constantly misread, the one for the other.

MR. EBERT: They claim—it is as plain in the Proceedings as possible—that it is a stimulant tonic.

MR. REMINGTON: I think Mr. Ebert hardly understood Mr. Lyons' point. He says, the printer might have made the mistake in substituting an *x* for an *n* in the paper of Mr. Dohme.

MR. EBERT: Then why do they disagree with Mr. Ebert? They say, "We have found no evidence of the *toxic** effect claimed for narcotine by Mr. Ebert" If they had agreed with him they would have said, "We have found evidence of the *tonic* effect claimed by Mr. Ebert." English is English!

Mr. Mayo moved to refer the paper for publication, and it was so ordered.

Mr. J. Percy Remington then read the following, receiving the applause of his audience.

## ACETIC ACID AS A MENSTRUUM FOR MAKING FLUID EXTRACTS.

BY J. PERCY REMINGTON.

It is now twelve years since the first experiments were begun with Acetic Acid as a solvent and preservative of the active principles of drugs, and now that the Revision Committee of the Pharmacopœia is considering the question of making some of them official, it may be well to sum up the experience of the last few years and give whatever information as to their preparation, properties and uses may be of interest to the pharmacist.

### THE NEED OF A NEW MENSTRUUM.

The use of alcohol in making extracts has alway been open to the objections that its stimulating effect is in many cases opposed to the action of the drug itself, and that for some drugs it is not a good solvent, since it too readily extracts fats and oils. The chief objection to it, however, has been the exorbitant tax on alcohol and its loss by evaporation in percolating.

### ANCIENT USE OF VINEGAR.

The consideration of these objections led the late Dr. E. R. Squibb, in 1891, to experiment with dilute acetic acid in extracting and preserving drugs. Vinegar having been used by the ancients for the preparation of embalming solutions and medicines, and in our own time for the extrac-

* As a matter of fact, the word "toxic" on p. 478 of the Proceedings for 1902 is a typographical error; the original paper of Crawford and Dohme contains the word "tonic," but not "toxic."—THE GEN'L SECRETARY.

tion of ipecacuanha, opium, colchicum, squill and cantharides, it was natural to suppose that its field of usefulness might be extended to other drugs.

### THE PROPER STRENGTH OF ACETIC ACID TO USE AS A MENSTRUUM.

Careful and exhaustive experiments were carried out by Dr. Squibb between the years of 1891 and 1900 to find the ideal menstruum, and different strengths of acid were tried for each drug, until the proper percentage was found. The result of these experiments has been that it was found possible to extract the active principles of 64 of the 88 pharmacopœial fluid extract drugs with dilute acetic acid, while of the remaining 24, 5 could be extracted with strong acid.

### THERAPEUTIC EQUIVALENCE OF ACETIC ACID AND ALCOHOLIC FLUID EXTRACTS.

Naturally, the first consideration to be thought of when the question of using these acetic preparations in place of the alcoholic came up was that of therapeutic equivalency. A careful examination of the marcs left in the percolators after exhaustion showed that all the active principles had been extracted, and by evaporating the fluid extracts a much larger yield of extractive was obtained than with the alcoholic extracts, and this extractive, whenever assayable, was tested, and was found in each case to contain the full amount of active principles. As a final means of testing the activity of these acetic fluid extracts, they were administered in the same doses as the U. S. P. preparations, and were found to be of exactly similar medicinal effect, but to be somewhat quicker in physiological action, and in the case of the alkaloidal drugs a little more potent, the latter fact being accounted for by the more complete exhaustion obtainable by acetic acid.

### WHICH VEHICLE IS BEST, ACETIC ACID OR ALCOHOL?

The conclusions that may be drawn from these facts are, briefly, as follows: Experience has definitely proven that acetic acid will extract and preserve the active principles of all the Pharmacopœia drugs, with the exception of those of an oleoresinous character, and that acetic fluid extracts can be used with the absolute assurance of getting the same medicinal effect as the alcoholic fluid extracts produce. Therefore the question reduces itself to this: Which vehicle is preferable, all things being considered, dilute acetic acid or alcohol? Experience is, of course, the only means of arriving at true conclusions in a matter of this kind, but certain practical comparisons that are already known may be of aid.

### PHYSICAL COMPARISONS.

With acetic acid the total amount of extractive is in most cases slightly greater than with alcohol. Some of this precipitates a few hours after the

fluid extract is made, but after being decanted the acetic fluid extract remains clear and does not continue to deposit as do the alcoholic preparations, and on assaying the deposit it has been proven that they do not contain the active principles which are in all cases readily soluble in acetic acid. Acetic fluid extracts, after they have been allowed to settle once, may be safely used as a basis for dilutions.

### ADVANTAGES TO THE MANUFACTURER.

From the manufacturer's standpoint the adoption of acetic fluid extracts would mean much less milling of the drugs, as the penetrating quality of this acid into woody fibre is such as to permit the percolation of leaves in the whole form, while roots merely require coarse powdering and barks to be bruised. The saving of expense both in the original cost of alcohol and the waste by evaporation is, moreover, so considerable as to warrant a very serious consideration. Alcohol costs $2.55 per gallon, $1.90 of which goes to the Government as Internal Revenue tax, and acetic acid of 10 per cent. strength costs 24 cents per gallon, so that it may be roughly stated that alcohol is ten times as costly.

### ADVANTAGES TO PHYSICIANS.

From the physician's standpoint, the most important question is that of medicinal effect, and in regard to this it may be said that the invariable results of extended trials in hospital and private practice have been that they act exactly similarly to the official preparations, except that in some cases they are slightly more potent. To the physician the acetic acid present appeals as an advantage in that it possesses a definite food value as one of the hydrocarbons. It acts as a mild acidulous aid in the first part of the digestive process, and is free from stimulating or other medicinal effect. The physician is also the one to whom the question of difference in taste would first appeal, and in this connection it may be said that as these fluid extracts contain from 6 per cent. to 8 per cent. of acetic acid they are somewhat stronger than vinegar, and hence are quite sour when taken undiluted, but as there is no necessity for taking them in the concentrated condition, since the dose in most cases is only a few drops, by mixing with water a solution is obtained in which the acetic acid is hardly noticeable.

### ADVANTAGES TO PHARMACISTS.

From the pharmacist's standpoint, this question is largely one of convenience in dispensing, and in this respect acetic fluid extracts possess decided advantages.

### DILUTIONS.

They afford a very good basis for diluting to the strength of tinctures, for making up into syrups or elixirs and when compounded in prescrip-

tions they do not precipitate as much as the alcoholic preparations.

### INCOMPATIBILITIES.

They have fewer incompatibilities since there is only one class of preparations with which they cannot be used satisfactorily—namely, the alkalies. It is not necessary to memorize the incompatibilities of acetic fluid extracts, as even the layman knows that acids and alkalies unite to form salts, whereas he might not know that bicarbonate of soda is not soluble in alcohol.

### UNIFORMITY IN STRENGTH.

Another important advantage to be gained by the pharmacist would be much greater uniformity in the quality and strength of fluid extracts. It is unfortunately true that there are manufacturers to-day who are selling fluid extracts for less than the cost of the alcohol required by the U. S. P. formula to make them. This condition is naturally explained by the fact that the fluid extracts have been made with dilute alcohol whereby a great saving of the cost of menstruum is obtained, and since the preparations contain so little matter soluble in alcohol they do not precipitate on dilution and look clear.

In concluding this paper, the opinion may be hazarded that considering the results obtained from these acetic fluid extracts in the last few years, many will eventually prove to be preferable to their alcoholic predecessors. Several years of careful observation has definitely shown that they are medicinally identical with, physically equal to, and economically far better than, the older preparations, and it is therefore hoped that these new preparations may be considered worthy of further investigation on the part of the pharmaceutical profession generally.

The Chair said the paper would take the usual course, without objection, and was now open for discussion:

MR. O. V. SMITH: I would like to ask Mr. Remington if he experimented with the oleoresinous drugs?

MR. REMINGTON: Yes, we have, and find that they cannot be extracted with dilute acid; but if 90 per cent. acid is used, complete exhaustion can be obtained.

MR. SAYRE: I made some experiments along this line about three years ago. I found by using 40 per cent acetic acid solvent I could very nicely dissolve the extractive, and I have some of the fluid extracts in my laboratory now, just as clear as clear can be, and seemingly perfectly preserved. I would like to ask Mr. Remington if he has found the exhaustion as complete in the case of the glucosidal drugs as in the alkaloidal?

MR. REMINGTON: In regard to the glucosidal drugs, I will say that we found the extraction could be made with the 10 per cent. strength that we used, and we have come to the conclusion that 10 per cent. of acetic acid is equivalent to 41 per cent. of alcohol, and we use it as the equivalent of that.

MR. SMITH: How about precipitation in acetic fluid extracts in comparison with alcoholic?

MR. REMINGTON: In regard to that, we may say that with acetic acid the amount of extractive is much greater, but some of this precipitates on standing, and hence, by storing them for a few months, a good deal of inert matter that might still remain in there is precipitated, and, since the solution is acid, all the active principles will remain in solution; therefore, by decanting or filtering, all the matter that will be precipitated is removed, and hence we can get a fluid extract that will remain clear. These acetic fluid extracts may be evaporated spontaneously, and thus used to produce solid extracts, since the acetic acid cannot be evaporated entirely, but remains in the extract in sufficient amount to preserve it. We thereby overcome the chief objection to the official process, namely, the use of heat in evaporating.

MR. LYONS: What about the keeping qualities of these extracts?

MR. REMINGTON: We have never had any trouble about that at all. None of these contain less than 6 per cent. of acetic acid. Vinegar is supposed to run about 5½ or 6 per cent., and even such easily decomposed organic matter as oysters is permanent in it. In the use of any dilute acetic acid solution the trouble occurs only when you get below 5 per cent. Vinegar of 4-per-cent. strength will mould. In reference to the amount of acetic acid taken in a dose of these fluid extracts, we may say that it is very inconsiderable when it is realized how small the average dose is, and that by diluting the strength of the acid it may be still further reduced. All of these fluid extracts here will stand dilution in the amount that would ordinarily be used in dispensing them, or at the bed side by the physician, with practically no precipitation. In taking a dose of each of these, both minimum and maximum, and diluting it with a teaspoonful of water, it will be found that there are only two here that precipitate to any extent. The rest remain absolutely clear by dilution in that quantity of water, or else get a little cloudy only. Red cinchona and cascara are the two that will precipitate on dilution. The only one here that the Pharmacopœia Committee is considering as having any trouble in keeping without precipitating is this lobelia (exhibiting a sample).

MR. GANE: How about the deposit in sanguinaria?

MR. REMINGTON: Yes: sanguinaria gives a coating on the bottle.

MR. LYONS: Does squill produce a good fluid extract with acetic acid?

MR. REMINGTON: Yes; a beautifully clear and efficient fluid extract of squill can be made, the only objection being that it is pretty thick, but not objectionably so, and the preparation will stand practically any dilution, without the slightest sediment.

MR. GANE: Is the strength of acid in these preparations sufficient to prevent mould from forming?

MR. REMINGTON: We have kept some of these fluid extracts on hand from the very beginning. When we first experimented with them, of course, we were anxious to find out what was the best strength to use in each case, and parts of these original extracts have been put away, and in the first experiments we used a pretty strong acid. We wanted to be on the safe side, and be sure the fluid extracts would keep, and used anywhere from ten to thirty per cent. of acid. But we have found by experience that wherever we keep the percentage of acid in the finished fluid extract above six per cent. there has been no trouble about that question whatever.

MR. KREMERS: I should like to ask a question with reference to two classess of pre-

parations, one of which is represented by the fluid extract of hyoscyamus and one cascara, among the samples I find on the table. We all know alcohol has been used extensively in the making of galenical preparations for its preservative properties, and it is a good solvent, too. There are two classes of active principles, however, which seem to me to demand that all substances of an acid character be excluded from the preparation. Take the glucosides, to which attention has been called, also the mydriatic alkaloids. Now alcohol has the property of preventing hydrolysis to a considerable extent, while water, for instance, will effect hydrolysis, especially in the presence of acids. By hydrolysis I understand the breaking-down or splitting-up of one molecule into two lesser molecules with the addition of the elements of water. In the case of glucosides the products are sugar and some other substances; in the case of mydriatic alkaloids it is tropine and tropic or some other acid. It seems to me that on general principles acetic acid should be excluded from all preparations that are readily hydrolyzed, because all acids have a tendency to facilitate hydrolysis, which alcohol checks. I should like to know whether attention has been given to this.

MR. REMINGTON: Yes, in general, these have been matters of serious consideration on the part of Dr. Squibb. He has written one or two articles in which he mentions the fact that some change may take place; but it has been a matter of theoretical, rather than practical interest, in view of the actual physiological tests. We have, however, practically come to the conclusion that acetic acid of that strength will not produce a change in the preparations.

MR. KREMERS: Acetic acid as such would cause hydrolysis. There must be something else in the fluid extracts which retards hydrolysis—counteracts the influence of the acetic acid.

MR. REMINGTON: That may be possible, and would be an interesting point to know about, as would also be the question of whether in any cases acetates of the alkaloids are formed.

MR. KREMERS: That was not the question I brought up. My question was, not whether atropine had been converted into atropine acetate, but whether acetic acid hydrolysized the physiologically active atropine into the physiologically inactive tropine and tropic acid.

MR. REMINGTON: We have not gone into that very extensively—not from that standpoint—but have considered more particularly the physiological results. The extracts have been tested for months at a time, on our own employees in the laboratory, in three different ways: First, by the administration of the fluid extract in the ordinary dose of the alcoholic preparation; then by the administration of the marcs left in the percolator, by taking the ordinary quantity of it, and then increasing it until we found that the dose of the marc gave practically no results physiologically. We can say positively that of the sixty-six fluid extracts we have now on our list, there is not a single one that is not most active. We are absolutely sure of that. They have been tested extensively in the hospitals, while those that have been used by the veterinarians have shown decided reaction medicinally. But that question of hydrolysis I do not think we have gone into very fully. Perhaps Mr. John Dunn can give us more information on this point.

MR. DUNN: No, we have always felt that the acetic acid acts merely as a solvent and preservative, and no scientific experiments have been carried on, as far as I know, in this direction, but, but we have felt that such were not necessary in the light of the practical result obtained.

MR. KEBLER: Mr. Remington spoke about the sale of fluid extracts taking place on

the market cheaper than the amount of alcohol required by the U. S. Pharmacopœia would permit. The natural inference is, of coure, when a product of this character is placed on the market that the product does not contain the proper amount of ethyl alcohol. Now, I have come up against these things on a number of occasions, and have found that the conclusions generally arrived at is not always correct. A few years ago I received a number of samples of this character, and I found the alcoholic strength was according to the Pharmacopœia. Now, what is the difficulty? I found on investigation this to be the trouble: that the manufacturers—the heads of houses—frequently do not know anything about the manufacture of their goods. It is left entirely in the hands of their employees. Frequently a bad product comes on the market at a cheap rate. Then these men write to their employers that they can buy this product at such and such a price. The employee wants to please his employer as much as possible, and he frequently falsifies his report, and from that fact the employer does not know exactly how much his goods cost. In a great many cases I know that to be the fact, the dealers and manufacturers do not know how much their goods actually cost them, just on account of things of that character.

MR. REMINGTON: We have tested fluid extracts which were specially recommended for the purpose of dilution to make tinctures, and found that some of them could be diluted with alcohol of 15 to 20 per cent. strength without precipitation. This has led us to believe that alcohol of about that strength, and not the official menstruum, was used in making them.

The Chair called on Mr. Wilbert to read a paper upon the subject of "A New Metric Medicine Glass," and the author began the reading of the paper, when Mr. Kebler made the suggestion that it would seem to come more properly before the Section on Practical Pharmacy and Dispensing. The Chairman said he had had some trouble in deciding the question as to where it should be read, but had finally concluded that it might be read before the Scientific Section. Mr. Wilbert thereupon continued the reading of his paper, exhibiting a sample of the glass described, and pointing out its merits, the text of the paper being as follows:

## A NEW METRIC MEDICINE GLASS.

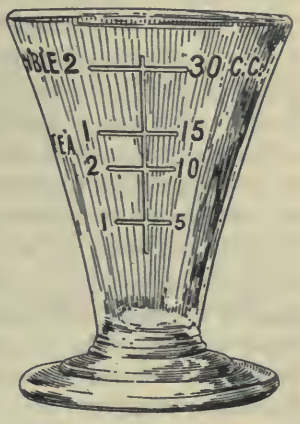
BY M. I. WILBERT, Philadelphia, Pa.

The inherent advantages of a conical graduate for measuring smaller quantities are so self-evident that it is surprising indeed that this particular shape has not been used more extensively as a medicine glass for measuring out doses of liquid medicines. It will be remembered that this Association last year at the Philadelphia meeting endorsed a set of resolutions outlining the desirable qualities of a glass medicine measure, and also defining approximate equivalents for tea and tablespoonful quantities in the metric system.

Since that time the Section on Materia Medica and Therapeutics of the American Medical Association has also adopted a set of resolutions recommending the use of the metric system of weights and measures, and practically endorsing the equivalents for tea and tablespoonful quantities adopted by the American Pharmaceutical Association at the Philadelphia meeting.

Having the endorsement of two national associations we have been able to induce one of our eastern glass manufacturers to make for us a medicine glass that combines metric quantities with the conical shape.

In general appearance this measure corresponds closely to a so-called sherry glass, without the stem. The total height of the glass is 7.5 Cm., the width at the top is 5.5 Cm., while the base is 5.0 Cm. in diameter, making an evenly balanced glass that is not readily upset.



New Metric Medicine Glass.

The glass is graduated in one and two teaspoonful, and one and two tablespoonful quantities with the metric equivalents, 5., 10., 15., and 30. Cc. indicated on the same lines.

Experimentally these glasses have been made in two styles, one with moulded graduations on the inner side of the glass, the other with engraved lines on the outer side. While the former can no doubt be made decidedly cheaper than the latter, there appears to be some difficulty in getting the graduations accurately adjusted, due, probably, to irregular shrinkage in the annealing process.

The style of glass having engraved lines on the outer side can be graduated much more accurately, and is more desirable in every way. In addition to greater accuracy this latter style has the added advantage that the graduations are not obscured when measuring dark colored or viscid liquids.

In a series of comparative tests that were recently made, it was found that either of these glasses will deliver indicated quantities with much greater regularity and accuracy than any other glass medicine measure available at the present time. This is particularly true of the one and two teaspoonful quantities, for which this particular shape was especially designed.

Among other advantages that might be claimed for a glass of this kind are the following.

The quantities indicated more nearly represent the actual capacity of ordinary spoons than do the equivalents indicated on the medicine measures now in use, graduated in drachms and ounces. The total capacity of the glass is sufficient to allow of diluting the contained dose for the patient, while the wide brim and tapering sides facilitate drinking from it.

This glass may also be used to advantage as a graduate or measure, the sides being short there is little loss from adhering liquids. In addition to these points the total absence of corners will facilitate cleaning, a not un-

important point when we consider the very poisonous nature of some of the mixtures that are at times measured by means of these household medicine measures.

In an assemblage of this kind it will not be necessary to call attention to the importance of securing at least some degree of accuracy in the measuring out and administering of doses of liquid medicines, particularly in view of the great amount of work that has been done by this association to secure greater accuracy and more uniformity in the composition of the liquid preparations of medicinal substances.

There is one point in this connection that it might be well to lay stress on, and that is that popular dose measures are primarily intended for and are used almost exclusively by persons that have had absolutely no special training, and little or no practical experience in measuring out small quantities of liquids, and, what is more, have little appreciation of the possible untoward effects that may result from a marked deviation from the prescribed dose or quantity. For this reason any contrivance or device that will serve to impress on the mind of the nurse or patient the desirability of greater care and accuracy in measuring out doses of liquid medicines will prove a distinct gain, and may be of great service in the rational advance of our knowledge of the action and uses of medicinal substances.

Whether or not this particular glass will prove as satisfactory as we expect, remains to be seen. A comparison with other forms of medicine measures will convince any one that, other things being equal, it will be much more difficult to make a serious mistake using a glass of this shape than with the ordinary wide-bottom, tumbler-shape medicine glass usually found in the shops.

The Chair stated that, without objection, the paper would be referred for publication.

MR. REMINGTON: I think we all agree that the conical glass is to be preferred. The only objection I have to that measure is the relation between the teaspoonful and the tablespoonful. You will observe it has 5, 10 and 15 centimeters. Although, of course, this is strictly a medical glass, it could not be used ordinarily, I think—in the ordinary way. The teaspoon is half a desertspoon, and a desertspoon is half a tablespoon. I have had a talk with Mr. Wilbert about this, and he knows my views in the matter. That question has also come before the Pharmacopœia Committee. Now, if we adopt in the Pharmacopœia for the equivalent of a teaspoonful, desertspoonful and tablespoonful, the metrical 5, 10 and 15 centimeters—a very convenient thing, and one that makes a symmetrical relation—you have got to educate the doctors of this country entirely away from the established practice of treating a tablespoon as double the size of a desertspoon, and a desertspoon as double the size of a teaspoon, and I don't believe you will do that in a century.

MR. LYONS: I cannot see what the teaspoon, desertspoon and tablespoon have to do with the doctor's prescriptions. In the metrical system of prescribing, the doses are 5, 10 or 15 cubic centimeters. In our system of prescribing it is 1, 2 or 4 drachms. The two

do not correspond. The ordinary prescription is in drachms. Let us drop the idea of teaspoonfuls, and we will have no trouble.

MR. O. V. SMITH: My experience has been that where the physician thinks he writes the metric system he will write the prescription in that way, but not the dose. I do not remember a case where the physician has prescribed the dose in the metric system, although the prescription may have been written in that system.

MR. WILBERT: In reference to the teaspoon, desertspoon and tablespoon, I venture to say that if the pharmacists will take the trouble to get the exact measurement of the teaspoons and these other spoons generally used, and as found on the market, it will be a revelation to some to find that they do not differ. It is surprising how little they differ in capacity. I have made experiments to test them, and they differ very little. And they do conform to the metrical formula, strange to say: the teaspoon at the present time is about 5 cubic centimeters, the desertspoon 10 and the tablespoon 15, and the latter will hold pretty nearly the equivalent of three teaspoonsful. Now the physicians prescribe teaspoon doses upon the idea that they contain about 4 centimeters, when as a matter of fact they contain about 5; in other words, a teaspoon will hold a drachm and a quarter, instead of a drachm, and a tablespoon will hold only three teaspoons, instead of four, as ordinarily believed. These metric equivalents are used in the majority of the pharmacopœias. The French Codex, for instance, gives exactly this equivalent of 5, 10 and 15 cubic centimeters for the teaspoon, desertspoon and tablespoon.

MR. EBERLE: I will say that in my experience the statements made by Mr. Wilbert are about correct. I found that out in trying to establish a double spoon—one side holding a tablespoon and the other a teaspoon, which would be equivalent to a fluid drachm, and I found that very few teaspoons on the market were of that measurement, but they were equal to five cubic centimeters.

The Chair called on Mr. H. M. Gordin to read a paper he had prepared, and Mr. Gordin read the following in abstract:

## ON THE CRYSTALLINE SUBSTANCES OF PRICKLY ASH BARK.*

BY H. M. GORDIN.

### PRELIMINARY NOTICE.

The discovery of a crystalline substance in northern prickly ash (Xanthoxylum Fraxineum, s. X. Americanum) is due to E. Staples.† The same crystals were also isolated later by J. U. Lloyd,‡ and more fully examined by G. Eberhardt.§ To this substance the name of xanthoxyline (xanthoxylin) was given by Staples.

Another crystalline substance was isolated by G. H. Colton‖ from the southern prickly ash (Xanthoxylum Carolinianum, s. X. Clava Herculis)

* The work was begun at the laboratory of the Wm. S. Merrell Chemical Co., to whom I wish to express my thanks for the liberal supply of material.

† Am. J. Pharm., 1829, 163.

‡ Am. J. Pharm., 1890, 229.

§ Am. J. Pharm., 1890, 231.

‖ Am. J. Pharm., 1880, 191.

and was shown by Eberhardt* to be different from the one contained in the northern variety of the drug.

Still another substance, also named xanthoxylin by its discoverer, was isolated by Stenhouse † from Japanese pepper (Xanthoxylum Piperitum, de C.). The xanthoxylin of Stenhouse is isomeric with cantharidin and seems to be entirely different from the crystalline principle contained either in the northern or in the southern prickly ash.

In order to avoid confusion I propose to retain the name xanthoxylin for the substance isolated by Stenhouse from Japanese pepper, and to designate with the name xanthoxylin N the crystalline principle of northern prickly ash, and with the name xanthoxylin S the crystalline principle of southern prickly ash.

### XANTHOXYLIN N.

Among the many substances which accompany the xanthoxylin N in the northern prickly ash, are a considerable amount of a fixed oil in which the xanthoxylin N seems to be very soluble, and an amorphous wax-like substance also soluble in the oil and in hot alcohol, but difficultly soluble in cold alcohol. As the xanthoxylin N is also easily soluble in hot, but difficultly soluble in cold alcohol, it is quite difficult to isolate the xanthoxylin N in perfect purity by simple recrystallizations from this solvent.

As the solubilities of xanthoxylin N and of the waxy substance in most other solvents seem to be very much alike, it becomes very wasteful to purify the xanthoxylin by recrystallization from the usual solvents.

A preliminary examination of some pure xanthoxylin N obtained from a previous batch showed that, while xanthoxylin N is insoluble in water, and only very difficultly soluble in cold alcohol, it is extremely easily soluble in cold alcohol containing about 10 per cent. potassium hydroxide in solution. Such a solution of xanthoxylin N in alcoholic KOH can be diluted with water to any extent without causing the slightest turbidity, even after standing for several months. But if a current of carbon dioxide be passed into the solution of xanthoxylin N in alcoholic KOH, either before or after diluting the solution with water, the xanthoxylin N is reprecipitated unchanged, provided the xanthoxylin N had not been boiled for a long time with the alcoholic KOH.

Making use of this behavior of xanthoxylin N, the best way to isolate it is as follows:

Exhaust the powdered northern prickly ash with benzene, distill the latter off and take up the oily residue with a mixture of alcohol, water and potassium hydroxide (for 100 grams oil take 20 grams KOH, 20 Cc. water and 70 Cc. alcohol). Warm the mixture gently about 10 minutes, dilute with water to about ten times the amount of oil taken and pass

* Loc. cit.

† Annal. Lieb., *89*, 251; *104*, 236.

$CO_2$ into the mixture till the latter commences to become thick and change color from green to yellow. The xanthoxylin N falls out at first amorphous, but on standing over night it becomes crystalline. The crystals are collected on a strainer, washed with water and recrystallized a couple of times from alcohol.

For analysis the xanthoxylin N was recrystallized till it had a constant melting point of 131–132° C.

0.2594 subst. : 0.66665 $CO_2$ and 0.1311 $H_2O$;
0.18275 subst. : 0.4679 $CO_2$ and 0.09765 $H_2O$.

$C_{15}H_{14}O_4$. Calculated C 69.73. H 5.47
Found C 69.95. H 5.82

An estimation of the molecular weight by the lowering of the freezing point, using benzene as a solvent, gave the following results:

| Substance. | Lowering of freez. p. | Mol. Wght. |
|---|---|---|
| 1. 0.07302 | 0.094 | 225 |
| 2. 0.25814 | 0.294 | 254 |
| 3. 0.60246 | 0.639 | 273 |
| 4. 0.96648 | 0.969 | 289 |

$C_{15}H_{14}O_4 = 258.14$.

The xanthoxylin N seems to contain one methoxyl group as shown by Zeisel's method.

1. 0.25532 subst. : 0.24578 AgI.
2. 0.27838 subst. : 0.27097 AgI.

$C_{14}H_{11}O_3(CH_3O)$. Calculated $CH_3O$, 12.03.
Found " 12.77.

The xanthoxylin N seems to absorb one mol. bromine when dissolved in glacial acetic acid and treated with a solution of bromine in the same solvent. The bromine compound seems to be to some extent saponifiable by water, as it cannot be washed with water till washings run off perfectly neutral. If the water runs through quickly the washings, after a certain time, are neutral to litmus, but on standing 5 or 10 minutes the moist bromine compound will again be found to be acid. This can be repeated many times with the same result.

I have succeeded in obtaining the bromine compound in beautiful crystals and will report the analysis later. A preliminary analysis by Carius' method gave figures about 15 per cent. too low, which would also seem to indicate a loss of bromine through saponification.

Though the above-mentioned peculiar behavior of xanthoxylin N toward alcoholic KOH and subsequent treatment with $CO_2$ would seem to indicate a phenolic character,* no OH group could be detected by the usual meth-

* Raikow and Momtschilow, Chem. Ztg., 1902, 1237.

ods. Neither could an aldehyde or a carbonyl group be shown by means of hydroxylamine, phenylhydrazine, etc.

Neither cold nor hot aqueous KOH affects xanthoxylin N. Prolonged boiling with either aqueous or alcoholic KOH changes it to an acid soluble in alkalies or alkaline carbonates. The acid is colorless, but seems to give colored salts of no great stability.

Several other derivatives were obtained from xanthoxylin N and will be reported upon later.

XANTHOXYLIN S.

The xanthoxylin S existing in southern prickly ash, seems to be nearly related to the xanthoxylin N of the northern bark. Analysis seems to indicate that it is the next lower homologue of xanthoxylin N, *i. e.*, it contains $CH_2$ less than xanthoxylin N.

Xanthoxylin S does not behave towards KOH and $CO_2$ like xanthoxylin N, and the method used for the separation of the latter from the oil cannot be used for the separation or purification of xanthoxylin S. As the xanthoxylin S does not seem to be affected by boiling alcoholic KOH, it might be possible to separate it from the oil by saponifying the oil and shaking out with benzene or ether. I intend to try this method later on. For the present, I have obtained a small amount of the xanthoxylin S in the following way:

The powdered southern prickly ash was exhausted with benzene, the latter distilled off completely, and the oily residue mixed with twice its volume of petroleum ether. On standing over night a considerable amount of a crystalline sediment separated out. The crystals were taken up with cold ether, the ethereal solution filtered, the ether distilled off, and the residue recrystallized repeatedly from hot alcohol.

Thus obtained the crystals were snow-white, and melted at 119–120° C.

Analysis gave the following results:

1. 0.28585 subst. : 0.71587 $CO_2$ and 0.1429 $H_2O$.
2. 0.1150 subst. : 0.2901 $CO_2$ and 0.0575 $H_2O$.

$C_{14}H_{12}O_4$. Calculated C 68.81, H 4.96.
Found C 68.54, H 5.62.

No methoxyl groups could be found by Zeisel's method. The xanthoxylin S is possibly an alcohol or a phenol of which xanthoxylin N is the methyl ether. The formula of xanthoxylin S could then be written $C_{14}H_{11}(OH).O_3$, and that of xanthoxylin N, $C_{14}H_{11}(O.CH_3)O_3$. The figures obtained by the elementary analysis of xanthoxylin S would also correspond to the formula $C_{21}H_{18}O_6$. An estimation of the molecular weight by the freezing point method with benzene as solvent, gave as an average 326. The formula $C_{14}H_{12}O_4$ gives 244.12; the formula $C_{21}H_{18}O_6$ gives 366 for the molecular weight. A study of other derivatives will be required for the establishing of the exact formula of xanthoxylin S.

This work is to be continued.

*Northwestern University School of Pharmacy.*

The gentleman's presentation of his subject was applauded, and the Chair stated that, without objection, the paper would take the usual course.

The Chair called upon Mr. Raymond H. Pond to read a paper he had prepared upon wire sieves, and said that there might be some question in the minds of some as to whether the paper should be read before the Scientific Section, but that he thought there could be no proper objection, and the question of the measurement of the meshes of sieves was a scientific subject, he thought, though the application thereof might not be, that subject properly belonging to another Section.

Mr. Pond then presented his paper, as follows, receiving the applause of the audience:

## MEASUREMENTS OF THE WIRES AND MESHES OF SIEVES—PRELIMINARY REPORT.

BY RAYMOND H. POND, CHICAGO, ILL.

The different Pharmacopœias are somewhat at variance as to the directions given for governing the fineness of powders. The British Pharmacopœia, in a short paragraph, states that the coarseness or fineness of a powder shall be designated by numbers which represent the number of parallel wires of ordinary diameter in one inch in either transverse direction. In the body of the book, however, no use is made of such numbers, and no definite degree of fineness is stipulated for the phrases used, such as "in fine powder," "in very fine powder," etc.

The German Pharmacopœia provides for six (6) degrees of fineness, and gives a numerical equivalent of the terms coarse, medium, fine, etc., which are employed in the body of the book.

The French Pharmacopœia states that horse-hair cloth does not give a homogeneous powder, but that silk and brass-wire cloths do. In each case—that is, for every powder—the French Pharmacopœia states the number of the sieve through which the powder shall be passed, and also of what material the sieve shall be. For all the finer powders the directions require silk cloth.

The Swiss Pharmacopœia provides for seven degrees of fineness, and directs of what material the sieve shall be made; thus, coarse powders are sifted through sieves of tinned-iron thread, while medium ones must pass through brass-wire cloth, and finer powders are passed through silk cloth. In addition, the Swiss Pharmacopœia contains a list of fifty-three (53) of the most important drugs, and gives the degree of fineness for each one, and whenever a drug is used it is supposed to be compounded with the fineness directed in the list. Of these fifty-three drugs, thirty-nine (39) must be of sufficient fineness to pass through a sieve having 37–40 meshes per Cm., and twelve (12) of the fifty-three must be still finer—50–51 meshes per Cm. U. S. P., No. 80—30 per Cm.

The United States Pharmacopœia provides for five degrees of fineness,

and the directions for preparing a given powder include a statement as to the fineness required. In addition, our Pharmacopœia directs that that not more than one-fourth (¼) of the powder which has passed through the number of sieve intended shall be able to pass through a sieve having ten meshes more per linear inch.

A fine powder in Great Britain is of uncertain fineness; in Germany it is determined by a sieve having forty-three (43) meshes per Cm.; in Switzerland, by a sieve having 37–40 meshes per Cm., and in the United States by a sieve having 24 meshes per Cm.

It is to be regarded as a safe and practical assumption that there is an optimum degree of fineness for each drug, which is largely dependent upon its histological character. Before this optimum fineness may be ascertained, however, it is necessary to have reliable sieves. As a preliminary step in an investigation which it is hoped will place the whole subject upon a more satisfactory basis, I have undertaken to make measurements of the meshes and wires of the various samples of sieves on the market. Similar measurements were made on a smaller scale several years ago by Bastin, but the intervening time necessitates more recent data. Samples of various sizes of brass wire-cloth have been received from six of the large manufacturing firms—the cities of New York, Philadelphia, Detroit, Cincinnati and Chicago being represented. The number of meshes per inch in both directions has been determined for each of the nine sizes of samples sent by each of the six firms. These readings were made with a magnifying glass and standard steel rule, a dissecting needle being used as a pointer guide.

For three of these firms much more elaborate measurements have been taken. Twenty-five meshes for each size have been measured in both directions, and the diameter of both wires in the twenty-five cases for each sample have been read. For this work the ocular micrometer was used. Such measurements bring out the variation in size of the individual meshes, and the tabulated readings show the maximum, minimum and average of the twenty-five readings. By dividing the average mesh dimension in a given direction into one inch, the number of meshes per inch for that direction is obtained, and in all cases this was found to agree closely with the number obtained by direct count.

The most prominent result obtained thus far is, that most of the sizes are true only in one direction, thus a number 50 sieve may have 50 meshes per inch in one direction, but only 40 in the other transverse direction.

Nos. 20 and 30 are practically true in both directions for each of the six firms. Nos. 40, 50 and 60 are about true in one direction, but usually untrue in the other, while Nos. 70, 8 , 90 and 100 are most likely to be untrue in both directions, the variation, however, being always greater in one direction, it seems that the warp is much more correctly spaced than the woof.

The wires tend to be very constant in diameter, but a few samples were discovered, in which the warp diameter differed from the woof diameter.

The samples of one firm are truer than those of another, and in one case sufficiently correct to justify the expectation that correct spacing is possible for brass wire cloth up to at least 100 meshes per inch.

The maximum difference of diameter between the warp and woof was found in a No. 60 sample, and amounted to approximately $\frac{1}{9}$ of the average space length and about $\frac{1}{6}$ of the average space width in this No. 60 sample.

Similar measurements are anticipated for silk and horsehair cloth, so that we may know what sieve on the market is most reliable.

As soon as accurate sieves become available, we may then determine the optimum fineness of each drug for a given purpose, and require that such fineness shall be employed.

The preliminary work thus far indicates that the brass cloth sieves now used are not sufficiently accurate in the sizes above No. 30.

The Chair stated that the paper would take the usual course, without objection.

MR. REMINGTON: Mr. Chairman, I am very glad to hear the paper read by the gentleman. I have been doing some work on this subject myself. Some of you may have seen the paper I read before the Pennsylvania Pharmaceutical Association in June. I also communicated the results to the Pharmacopœia Committee. I only want to say that for many years—indeed ever since our Pharmacopœia has been established—we have neglected to take into consideration the fineness of the wire used in making sieves. I would be very glad to turn over to the gentleman a large collection of samples of sieves and sieve-cloths that I have, if he may wish to make more accurate measurements. I have them from all the principal manufacturers of the country. One of the principal manufacturers admitted that, in the lower degrees of fineness, if you count the number of meshes in an inch you would find them nearly uniform, but in the higher degrees, like 100, you would not, because it was impossible to so manufacture them with the present machinery. But the point I want to emphasize is this: That one manufacturer selling a number 20 powder might be selling a very different product from another manufacturer selling the same, and yet both be right, because in one case the wire was double the diameter of that in the other, which would reduce, of course, the area of the mesh. I don't know whether the gentleman considered that point.

MR. POND: Yes, sir; that was considered.

MR. REMINGTON: I mean that the wire itself varies. The point is that one manufacturer will make a No. 20 with what he calls a 29-gauge wire, while another will make it from a 36 wire, and if the sieve is made out of the one or the other, in the one case you will have a No. 20 powder, while in the other case, with the thicker wire, you will have a No. 35 or 40 powder to go through, because you have the smaller mesh. I have found out this fact by correspondence with the manufacturers. I told them what the difficulty was, and I found out what they send when an order is given for a No. 20 sieve; they will send a No. 20 made from a 29 wire, when it is not ordered. Sometimes a man may have a heavy powder, and that cloth is not heavy enough for his purpose, and he says "Make that wire-cloth heavier," forgetting that

he makes the hole smaller, and he does not get a 20 powder. We want to look into this matter. No Pharmacopœia would be complete, I think, without designating the gauge of the wire for a No. 20 powder, and then we would have a uniform thing all around.

MR. POND: I will say that my measurements are abundantly adequate to bring out any variation. The measurements are made in both directions, and also the diameter of the wire, and it is measured for each mesh, the average being taken from twenty-five different samples, and the mesh being measured diagonally. I hope to continue the effort to find the best sieve on the market.

M. KEBLER: Another element enters into this matter, and that is, a great many manufacturers use bolting-cloth. That is entirely different. I have had some of these measured, and they seem to differ entirely from the customary measurements given for them. But, allowing for all the variations of these sieves, they are not at all variable to the extent that powdered drugs furnished by the various makers are. Mr. Oldberg wrote me that a paper of this character would be read at some section meeting of the Association, and to show the variation of these products I put a few samples in my pocket to show what product is sent out when powdered drugs are called for. Dr. Wiley sent out a number of letters to which he received replies in which the writers seemed to think that a No. 2 sieve must have been mistaken for a No. 20. But this was not a mistake in the original letter, as the samples herewith submitted will clearly show. I have some residues here which will not pass through a No. 2 sieve. Fifty-three per cent. of this powder here will not pass through a No. 20 sieve; that is red cinchona bark. Here is nux vomica. This has a residue of 56 per cent. The question naturally arises, what can the retail druggist do with articles of this character? I don't mean the large manufacturer.

MR. CASPARI: Of course we all know that the Pharmacopœia recognizes a slight variation in the powder—that is, a variation to the extent of 25 per cent. For example, a No. 40 powder should not contain more than 25 per cent. of a powder that would pass through a No. 50 sieve. The Pharmacopœia takes cognizance of the fact that there must be some little variation in the powders passing through the mills. Referring to what Mr. Kebler has said, Dr. Wiley sent me a letter asking me what I thought of a powder that would not pass through a No. 2 sieve. I was very much surprised at the suggestion of such a thing, and said I did not think it was possible—that it was a new thing in my experience. I had no idea that such a powder was on the market.

MR. KEBLER: If you gentlemen will look at this powder here, I believe you will agree with me that it will not pass through any sieve allowed by the Pharmacopœia, and yet that powder was sent by a very reliable firm. But the question is, as I have stated before, Do the heads of firms know it?—that is the question.

Mr. E. H. Gane, at the request of the Chair, then read the following paper:

## COD-LIVER OIL AND ITS ADULTERANTS.

BY E. H. GANE, NEW YORK CITY.

The present scarcity of Norwegian cod-liver oil, coupled with the extraordinary advance in the market price, has resulted in especial attention being drawn to this article. The fact that the present year's crop of oil is totally inadequate to supply the normal demand, has led to the offering of numerous substitutes and to considerable adulteration.

It is somewhat of a reflection upon American manufacturers that we should be still almost wholly dependent on foreign sources for our supply of cod-liver oil in view of the fact that fish sufficient to supply the markets of the world are annually caught off our coasts. Cod-liver oil, it is true, is produced in considerable quantity, but its quality is such as to practically bar its use for medicinal purposes. With a protective tariff of $4.00 per barrel (of 30 gallons) in our favor, there can be no excuse for such a condition of affairs. It has been pointed out time and time again, that cod-liver oil, of quality second to none, can be produced in this country, but manufacturers still seem loth to take advantage of their opportunities.

The New Foundland makers are more wide awake and have for years turned out a fine grade of medicinal oil, which is fully equal, if not superior to the Norwegian product. Strangely enough, almost the whole of their surplus product goes to Europe, the annual sales to the United States being a mere trifle, and at the present time the world is looking to that island to supply the deficiency in the Norwegian output.

The Norwegian oil holds its place in our market solely by reason of its superior purity, due to the care with which it is prepared, and to its freedom from admixture with oil from the livers of other fish. The majority of the New England output, the so-called "New Foundland," "coast," or "shore," oil is contaminated either by being prepared from decomposed livers, from the livers of other fish caught along with the cod, or sometimes by direct admixture with foreign oils. The main use of this oil in pharmacy has been either for the preparation of cheap emulsions or for mixing with the Norwegian oil. Much of it is of so objectionable a character as to be unfit for medicinal use.

Pharmaceutical literature is full of references to adulteration of cod-liver oil. Among the adulterants of Norwegian oil which have been mentioned, are shark-liver oil, oils from the ling, haddock and other fish which frequent the cod-fishing grounds, ray-liver oil, seal oil, mineral and rosin oils. No instance has been reported, however, of the finding of a specimen adulterated with the last substance, and shark-liver oil is no longer a commercial product. Occasional admixture of oil from the livers of fish caught along with the cod, doubtless occurs, but special care is taken by the leading Norwegian manufacturers to prevent even this addition, while the competition and the requirements of the European market has served for many years to prevent any extensive adulteration at producing centres. Among the adulterants of American oil mentioned are seal, menhaden and other fish oil.

The U. S. P. requires cod-liver oil to have a specific gravity of .920 to .925 at 15° C., to deposit very little or no solid fat when kept "for some time" at a temperature of 0° C., and to give a rose-red color, changing to lemon-yellow on admixture with fuming nitric acid. Lax as these requirements are, deviation from them is only too common in the case of the

commercial article. This is especially the case at the present time owing the failure of the Norwegian fishery. An examination of numerous samples of cod-liver oil offered in the New York market during the last six months show that unless the yield of pure New Foundland oil be unusually large, adulteration and substitution will, during the ensuing winter months, reach proportions hitherto unheard of. Before detailing the results of this examination it may be well to draw attention to the constants which are now generally accepted for fine medicinal oil.

*Specific Gravity.*—The Pharmacopœia limits are from .920 to .925, which are rather low, as most commercial samples range from .924 to .928. It is said that genuine samples may run as low as .920, but, if so, they are very scarce. The British Pharmacopœia limits are from .920 to .930, and the German from .926 to .931. The B. P. figures would seem to be within reasonable limits.

*Acidity.*—The U. S. P. allows a faint acidity to litmus paper moistened with alcohol. A definite limit of acidity would have been better, as this figure is a useful indication of admixture with other fish oils, as well as of the age of the genuine oil. Not to exceed 1 per cent., calculated as oleic acid, is generally accepted as a reasonable limit for medicinal oil.

*Melting Point of Fatty Acids.*—This should be within the limits of 21° to 26° C. Most samples average 23° to 25° C., rarely as high as 26° C.

*The Saponification Figure* is of little value as an indication of purity. Most fish oils vary but little from cod-liver oil in the amount of alkali required for saponification. The German Pharmacopœia allows a maximum of 19.6 per cent. of caustic potash.

*Iodine Absorption.*—This figure is useful as an aid in detecting adulterants other than fish oils. Authorities differ as to the limits allowable. Allen gives 126 to 166; Parry & Sage, 153 to 168, and the German Pharmacopœia, 140 to 152, with a four hours' absorption. These differences are probably due to variation in the time allowed for absorption. Allen says that two hours is sufficient, but in the author's experience this is too short a time. Some samples of cod-liver oil require at least four hours for complete absorption, and it is better to allow six in order to obtain uniform results. Allowing six hours' absorption, all commercial samples of genuine oil that have come under observation have fallen within the limits of 153 to 171 per cent.

*Sulphuric Acid Test.*—This is of no value for detecting admixtures. A violet coloration is produced with all liver oils. Substitutes other than fish-liver oils may be distinguished, however. The best mode of application is to dissolve the oil in carbon disulphide before adding the acid, as adopted by the German Pharmacopœia. Seal oil, when pure, is readily differentiated by this test.

*Nitric Acid Test.*—The British Pharmacopœia directs nitric acid (S. G. 1.42) to be added to the oil in a test-tube, when a ring of albumen should

be formed at the contact surface of the liquids. It is necessary to allow the tube to stand several hours, but the test is of little value as an indication of purity. A more reliable test is that mentioned in the U. S. P., which consists in adding five or six drops of fuming nitric acid to twenty drops of the oil, on a watch-glass. A rose-red color should instantly be produced at the points of contact. When the mixture is well stirred, the entire fluid should assume a rose-red color, which changes rapidly to orange and lemon-yellow if the oil is pure. This test is also official in the German Pharmacopœia. Bedall has recently stated that the test is not applicable to old oils. The author is not able to confirm this objection, oils which readily gave the reaction when fresh, still reacting perfectly when a year old. This statement is, however, based on examination of a limited number of samples. In the writer's experience this is one of the most useful tests of a pure oil. It is especially valuable for detecting admixtures of coast or shore oil, but is of little value for detecting admixtures with refined seal oil. A mixture of equal parts of Norwegian cod-liver oil and refined seal oil passes the test readily. Seal oil can, however, be easily detected in another way.

*Freezing Test.*—The U. S. P. and the German Pharmacopœia both state that on standing for "some time" at a temperature of 0° C. no solid fat should separate out. The B. P. fixes a time limit of two hours. This test is useful for excluding admixtures of seal and certain fish-liver oils, vegetable and lard oils, all of which give more or less precipitation under such conditions. Recently, however, non-freezing fish-liver and seal oils have been offered which will pass this test. It is rare, however, to find a refined seal oil which will not deposit some fat on prolonged subjection to a temperature of 0° C. Useful indications are obtained by subjecting the oil to still lower temperatures for a short space of time, and in the table of results appended the widely-divergent behavior of various oils on subjection to a temperatute of −5° C. and −10° C. for fifteen minutes is strikingly illustrated.

Of all the adulterants mentioned, seal oil is by far the most common at the present time. Much of the commercial seal oil is of a light-brown color and very strong fishy odor, entirely unsuited as a cod-liver oil substitute, but it is possible to obtain seal oil refined and bleached, so that the odor is almost entirely removed and the color nearly water-white. This variety is largely used for admixture with the coast oil in order to lighten it in color and reduce its odor. Considerable quantities are exported to Europe. Most authorities state that mixtures of this oil with cod-liver oil can readily be detected by the lower iodine number of seal oil, and by the nitric acid test. It has already been pointed out that this refined seal oil is so little affected by nitric acid that mixtures containing at least 50 per cent. will readily pass the test. The iodine absorption figure of seal oil is lower than that of cod-liver oil, but it will readily be seen from the de-

tails given below that this figure is not of much value *per se*. There is, however, one test—and, fortunately for the retail pharmacist, a very simple one—by which seal oil can quickly be detected. When saponified it yields a most evil-smelling soap, and mixtures of seal and cod-liver oil can at once be recognized by treating the oil with excess of alcoholic potash until a clear solution is formed and noting the odor of the resulting fluid. Pure cod-liver oil or mixtures of various fish oils yield a soap of a fishy or slight herring-like odor, entirely different from the foul odor of a seal-oil soap. The odor is intensified by diluting the alcoholic fluid with water, boiling to expel alcohol and acidifying the soap solution with hydrochloric acid to liberate the fatty acids. Seal oil in any proportion yields a mixture of a very characteristic objectionable odor. The freezing test is also useful for detecting mixtures of cod-liver and seal oils, non-freezing seal oils being the exception rather than the rule. Constants obtained on examination of samples of the commercial light-brown and water-white seal oils are given in the appended table. Menhaden oil has been mentioned as an adulterant, but its use is not common, on account of the difficulty in removing its strong herring-like odor. The bleached winter-white variety is obtainable of a very pale color and only a slight herring-like odor. It may be detected by the nitric acid test, and by the fact that the fatty acids are of a much higher melting-point than those obtained from pure cod-liver oil. The strong herring-like odor developed on heating with alcoholic potash is also a useful indication of its presence.

"Fish-liver oil," which has recently been offered in the London market seems to answer most of the tests for a pure cod-liver oil, and is likely to prove difficult of detection when mixed with the latter. It has a high acidity (3.10 per cent.) and a low refractive index.

An adulterant which has lately come again in use is lard oil. This oil lowers the specific gravity, has a very small iodine number, and its fatty acids are of high melting point. It can thus be readily detected when mixed with cod-liver oil.

Appended is given a table of results obtained from examination of a number of samples of cod-liver oil offered in the New York market during the past season:

TABLE OF RESULTS OF EXAMINATION OF SAMPLES OF COD-LIVER OIL OFFERED IN THE NEW YORK MARKET.

| Sample. | Color. | Odor. | Specific Gravity 15.5° C. | Per Cent. of Free Fatty Acids. | Melting Point of Fat Acids. | Per Cent. of KOH for Saponification. | Saponification Equivalent. | Iodine Absorption Per Cent. 6 Hours. | Nitric Acid Test. | | Freezing Test. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Before Stirring. | After Stirring. | At 0° C. | At -5° C. | At -10° C. |
| No. 1. NORWEGIAN OIL. | Pale straw. | Characteristic. | .9268 | 1.12 | 24° C. | 19.25 | 290 | 171 | Rose-red. | Rose-red to lemon-yellow. | Clear. | Slight turbidity. | Very turbid. |
| No. 2. NORWEGIAN OIL. | Pale straw. | Characteristic. | .9255 | 1.32 | 21.5° C. | 18.81 | 297 | 167 | Rose-red. | Rose-red to lemon-yellow. | Clear. | Clear. | Very faint turbidity. |
| No. 3. NORWEGIAN OIL (Old). | Light brown. | Strong fishy. | .9245 | 5.11 | 29° C. | 18.47 | 303 | 153 | Brownish-red. | Dark brown. | Clear. | Clear. | Solid. |
| No. 4. NORWEGIAN OIL. | Yellow. | Characteristic. | .9254 | 3.52 | 22.5° C. | 19.14 | 292 | 153 | Rose-red. | Deep orange to lemon-yellow. | Clear. | Clear. | Clear. |
| No. 5. NEWFOUNDLAND OIL. | Pale straw. | Characteristic. | .9275 | 1.15 | 24° C. | 19 14 | 292 | 164 | Rose-red. | Rose-red to lemon-yellow. | Clear. | Slight flocculent ppt. | Turbid flocculent ppt. |
| No. 6. COAST OIL. | Pale straw. | Like Seal Oil. | .926 | 2.06 | 24.5° C. | 19.65 | 284 | 158 | Light brown. | Dirty brown. | Clear. | Clear. | Clear. |
| No. 7. COAST OIL. | Deep straw. | Slight Herring Odor. | .926 | 3.94 | 24° C. | 19.37 | 289 | 160 | Brown. | Reddish-brown. | Clear. | Clear. | Thick turbid. |
| No. 8. COAST OIL. | Straw. | Slight Herring Odor. | .9265 | 3.86 | 26.5° C. | 19.25 | 290 | 154 | Light brown. | Dirty brown. | Clear. | Clear. | Solid. |
| No. 9. COAST OIL. | Yellow. | Slightly fishy. | .925 | 2.39 | 28° C. | 18.58 | 301 | 150 | Reddish-brown. | Dark dirty brown. | Clear. | Clear. | Very thick and turbid. |
| No. 10. | Pale yellow. | Fishy. | .9265 | 1.55 | 25.5° C. | 19.03 | 294 | 161 | Reddish-brown. | Dark reddish-brown. | Clear. | Clear. | Clear. |

TABLE OF RESULTS OF EXAMINATION OF SAMPLES OF COD-LIVER OIL OFFERED IN THE NEW YORK MARKET.—*Concluded.*

| Sample. | Color. | Odor. | Specific Gravity 15.5° C. | Per Cent. of Free Fatty Acids. | Melting Point of Fat Acids. | Per Cent. of KOH for Saponification. | Saponification Equivalent. | Iodine Absorption Per Cent. 6 Hours. | Nitric Acid Test. | | Freezing Test. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Before Stirring. | After Stirring. | At 0° C. | At −5° C. | At −10° C. |
| No. 11. | Yellow. | Like whale oil. | .9274 | 1.29 | 24° C. | 18.75 | 298 | 165 | Reddish-brown. | Yellowish-brown rapidly darkening. | Clear. | Clear. | Clear. |
| No. 12. | Pale straw. | Strong like herrings. | .931 | 1.41 | 26.5° C. | 17.61 | 317 | 162 | Brown. | Light brown. | Clear. | Clear. | Thick turbid. |
| No. 13. | Pale yellow. | Fishy. | .9263 | 5.20 | 27° C. | 19.36 | 288 | 164 | Reddish-brown. | Reddish-brown to nearly black. | Faintly turbid. | Very turbid. | Semi-solid. |
| No. 14. | Very light straw. | Ft. fishy and like lard oil. | .9215 | 0.65 | 35° C. | 19.93 | 280 | 119 | Faint brown. | Faint brown. | Slight flocculent ppt. | Very thick and turbid. | Solid. |
| No. 15. | Deep straw. | Slight like whale oil. | .927 | 3.84 | 26° C. | 19.37 | 289 | 167 | Brown. | Dark brown. | Cloudy slight ppt. | Heavy flocculent ppt. | Thick semi-solid. |
| No. 16. | Pale straw. | Slight seal odor. | .9244 | 1.21 | 25.5° C. | 18.8 | 297 | 154 | Light brown. | Deep yellowish-brown. | Very cloudy. | Thick, very turbid. | Semi-solid. |
| No. 17. MENHADEN OIL (Bleached). | Very pale straw. | Like herring. | .9255 | 1.33 | 33° C. | 20.04 | 297 | 117 | Light brown and rose-red streaks. | Dirty red-brown. | Clear. | Clear. | Clear. |
| No. 18. SEAL OIL. | Light brown. | Strong characteristic. | .9285 | 1.94 | 24° C. | 19.81 | 282 | 137 | Rose-red and brown streaks. | Dirty red-brown, very dark. | Clear. | Clear. | Clear. |
| No. 19. SEAL (Bleached). | Faint straw. | Very slight fishy. | .9224 | 0.67 | 23.5° C. | 18.25 | 305 | 140 | Faint brown. | Faint brown. | Heavy flocculent ppt. | Very thick, Semi-solid. | Solid. |

Numbers 1, 2 and 4 were samples of Norwegian oil from original packages, and are to be taken as extreme types rather than as representative samples, which usually run inside these limits. The high acidity of No. 4 points to the presence of other fish oils. No. 3 was claimed to be simply an old sample, but it is obviously of doubtful purity. The high acidity might be due to age, but the high melting point of the fat acids is suspicious. Sample No. 5 is a New Foundland oil and of excellent quality. Samples Nos. 6, 7, 8 and 9 are representative coast or shore oils. The high acidity and melting point of the fat acids are characteristic of this kind of oil. Nos. 8 and 9 contain seal oil as indicated by the odor on saponification, low iodine number and freezing test.

Samples Nos. 10, 11, 12, 13 and 15 were offered as Norwegian oil in original tin-lined casks, and are probably mixtures of Norwegian and coast oil. The latter contained seal oil.

Sample No. 14 is interesting from the fact that it came from an apparently intact package of one of the leading Norwegian manufacturers through a New York jobbing house. It is almost pure lard oil.

Sample No. 16 is nearly pure seal oil.

Sample No. 17 is a typical sample of bleached winter-white Menhaden oil.

Sample No. 18 is the ordinary commercial seal oil, while No. 19 is a specially refined oil prepared from young seals, and sold for "mixing" with cod-liver oil.

The figures in the above table were obtained by the usual methods. The free fatty acids are calculated as oleic acid, and the percentage is found by heating a known weight with excess of carefully neutralized alcohol, and titrating with decinormal alcoholic potash, using phenolphthalein as the indicator. The iodine figure is for six hours' absorption. The results noted under the head of "freezing test" were obtained by keeping the oil for a period of 15 minutes at the temperature indicated. At $-15°$ C. all the samples froze to a solid mass.

For the benefit of the retail pharmacist who has not the time nor apparatus for making the various determinations, or who may object to them on the ground of their being "too scientific" for him, and who demands a simple test that can be carried out in the store, it may be pointed out that if he will perform the following three simple tests he will be able to form a not inaccurate opinion as to the quality of oil furnished him:

1. Place half an ounce of the oil in a test tube and allow it to stand in shaved ice for two hours. A pure non-freezing oil should remain perfectly clear.

2. Boil one fluid drachm of the oil with half an ounce of a 5-per-cent. solution of caustic potash in alcohol until the solution is clear. Dilute with two ounces of water and heat until the alcohol is expelled. Then add an excess of hydrochloric acid and note the odor of the fatty acids.

A strong herring-like odor or a bad-smelling liquid indicates adulteration with seal or other oils. A faint herring odor may be disregarded. Pure cod-liver oil usually yields a soap, and fatty acids of a fishy smell, with no bad odor.

3. Place 20 drops of the oil on a watch-glass and add five drops strong nitric acid. Stir well and note the color. Pure cod-liver oil gives a beautiful rose red color, which changes in about half an hour to lemon-yellow. A dirty brown or blackish mixture indicates adulteration with other oils.

A bibliography is appended for the assistance of those interested.

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Cod-Liver Oil, Tests for Purity and Identity. A. Kremel, Pharm. Post, 1884, 30, 31. American Druggist, Nov., 1884, p. 217.

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Seal Oil in Cod Liver Oil, Detection of. E. Dowzard, Pharmaceutical Journal, June 4, 1898, p. 532.

Cod-Liver Oil, Examination of. Utz, Zeits. Offentl, Chem. 8, 304–306.

Cod-Liver Oil, Possible Fallacy of the Nitric Acid Test for. Bedall, Pharm. Centralh., Feb. 27, 1902, p. 118.

Fish-Liver Oil, J. C. Umney and C. T. Bennett, Chemist and Druggist, July 4, 1903, p. 37.

The paper was greeted with applause, and the Chair announced that it would take the usual course, without objection.

Mr. Beringer, seconded by Mr. Cliffe, now moved a reconsideration of the action of the Section this morning in receiving and adopting the report of the Committee on Drug Adulterations, saying he would explain his reasons in another motion.

There was objection on the part of some of the members to considering the motion at this adjourned session, which was not a part of the official programme, and only called to read and consider papers, while others objected to voting on a motion that they did not know the significance of, and after some remarks by Messrs. Ebert, Hallberg, Cliffe and others, the Chair ruled that the motion could not be entertained at this time.

Thereupon, upon motion of Mr. Kremers, the Section stood adjourned to 8 o'clock this evening.

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## Second Session—Wednesday Evening, August 5, 1903.

The second session of the Section on Scientific Papers was called to

order by Chairman Schlotterbeck at 8 : 50 p. m., in the west parlor of the Grand Hotel.

The Chair announced that the first order of business was the reading of the minutes of the previous session, but on motion of Mr. Wilbert this was dispensed with.

The Chair then called for further nominations for officers of the Section for the ensuing year, saying that at the first session Mr. Joseph W. England, Mr. W. A. Puckner, and Mr. M. I. Wilbert were placed in nomination for Chairman, and that other nominations for this office might now be made.

MR. KREMERS: Mr. Chairman, inasmuch as Mr. Puckner asked to withdraw his name from nomination for Chairman, I should like to renominate the gentleman. I do this for the following reason: Although not a rule of the Association, it has been something of an unwritten law that we do not elect persons to office in this Association who are not present, since we do not know whether they can be present at the next annual meeting. Concerning Mr. Puckner, I should like to call attention to the fact that not only has he been a member of the Association for a number of years, but he has been one of the faithful members of the Scientific Section during those years. It seems to me we owe it to those members who have not only attended the meetings from year to year, but who have given their time and their energies to the Scientific Section, to bestow upon them such honors as the Section can give, and it is for that reason that I should like to place in nomination again for Chairman, Mr. W. A. Puckner, of Chicago.

Mr. Wilbert said he had already, at the morning session, withdrawn his name for chairman, but he supposed he could do so again at this session.

MR. LOWE: If there is a special reason for electing Mr. Puckner chairman of the Section on account of his work on this committee, then there is a still greater reason for electing Mr. England, because he has been Secretary of the Section for two years, and has done excellent service, and he was present at Philadelphia, St. Louis and Richmond. It was not his fault that he was not here to-day, and I do not think we ought to proscribe a man because he has been unfortunate enough to have sickness in his family. He would have been glad to be here, and expected to be here, and was only prevented from coming for that reason. So far as Mr. England's qualifications for this place are concerned, I think he will measure up to the standard of most of the men who have held the position. He is a pharmacist of undoubted ability, and is the author of articles of merit that have appeared in the leading journals of pharmacy, and I know he will honor the position and honor the Section.

MR. KREMERS: The remarks of the gentleman who has just spoken place a false construction on what I had to say. I had no intention of comparing the relative attainments of Mr. England and Mr. Puckner; I simply spoke of the unwritten rule of the Association in such matters—not because one member is better than another, but because we do not want to establish precedents that we may regret. What I say of Mr. Puckner is, that I think he is fitted for the position, and, under the circumstances, I think he is the only candidate that ought to be considered.

The Chair called for further nominations for chairman, but there was no response, and, on motion of Mr. Caspari, nominations for this office were ordered closed. Thereupon the Chair appointed Messrs. Wm. Hauenstein and J. W. T. Knox to take the vote by ballot.

MR. LOWE: I would like to remind Mr. Kremers that he himself was elected once to a position of this kind when he was not present. Am I not correct?

MR. KREMERS: I am not aware of it.

MR. CASPARI: Mr. Kremers was elected, while present, at Lake Minnetonka, and served at Baltimore. I say this to correct a possible misunderstanding.

The tellers just appointed took the vote of the Section by ballot, with the following result: Total number of ballots cast, 74; for Puckner, 43; for England, 29; for Wilbert, 2. The Chair thereupon declared Mr. W. A. Puckner duly elected Chairman of the Scientific Section for the ensuing year. [Applause.]

The Chair stated that nominations for Secretary were now in order, and called attention to the fact that Mr. Puckner, just elected Chairman, had also been nominated for Secretary at the first session, and that Mr. Wilbert had asked to have his name withdrawn, which left no nominations for Secretary before the section. Thereupon Mr. Knox nominated Mr. E. H. Gane, of New York, for the position, which motion Mr. Alpers seconded, moving at the same time that nominations for Secretary be closed, which motion prevailed. Mr. Mayo then moved that the present acting secretary of the Section be instructed to cast the ballot of the Section electing Mr. Gane to this office. The motion carried, and the acting secretary announced that he had cast the ballot as directed, whereupon the Chair declared Mr. Gane duly elected Secretary of the Scientific Section for the ensuing year.

The report of the Committee on Chairman's Address was called for, and Mr. Kebler presented the following:

REPORT OF THE COMMITTEE ON CHAIRMAN'S ADDRESS.

Your committee has carefully considered the Chairman's excellent address on the Mydriatic Alkaloids, and finds it to contain several queries which we hope will some time be answered in a satisfactory manner. The results reported on are the outcome of an investigation started some years ago by the Research Committee formerly connected with this Section. This work was characterized by the great care taken in inspecting and selecting the original material, resulting in obtaining fifty pounds of belladonna root, which on assay was found to contain nearly 1 per cent. of alkaloids. Your committee was informed by Dr. Rusby that, in the opinion of Dr. Prescott, the alkaloids removed from this root were about the purest he had ever seen. The committee highly commends the excellence of this address, and hopes that it will be a stimulus for others in the field of research.

Respectfully submitted,

LYMAN F. KEBLER,
H. KAHN,
J. A. KOCH,
*Committee.*

The Chair stated that he could readily appreciate the situation in which the committee was placed; that there was really nothing in the address to refer to a committee—no recommendations made or questions asked.

Upon motion of Mr. Dohme, the report was received and referred for publication.

MR. BERINGER: Mr. Chairman, if in order now, I would like to renew my motion made this afternoon, viz., to reconsider the vote by which the report of the Committee on Drug Adulteration was adopted.

The motion was seconded by Mr. Cliffe and carried.

MR. BERINGER: Now, Mr. Chairman, I move, sir, that that portion of the report that refers to the subject of thymol iodide and aristol, and the samples accompanying it, be not published, but be referred to a special committee of three chemical experts to make a thorough examination of said samples, and also of similar samples purchased in the open market, and make a complete report to this Section next year.

MR. HALLBERG: I move to amend, that, in lieu of the reference to the committee of three experts, it be referred to the proposed National Bureau of Medicines and Foods.

MR. BERINGER: Mr. Chairman, at the time this report was adopted this morning I was busily engaged and failed to note the matter. Subsequently my attention was called to it, and also to the samples exhibited. Now, I have done a little work along this line, and there were certain earmarks that made me suspect immediately that the work was fallacious, or something else was wrong somewhere, and this work should not be published until we are absolutely certain it is correct. The figures are so large that there must have been gross adulteration after it was put on the market. These samples reflect on the character of three reputable members of our Association, and I feel that I would not be doing justice to myself, justice to the Association and justice to the profession of pharmacy, which I hope not to dishonor, if I did not make this motion.

A MEMBER: For the benefit of several of our members who were not present this afternoon, I would like to ask what this particular point was in regard to aristol.

MR. BERINGER: The packages were exhibited—not openly and passed around, but left on the table—in such a way that certain members saw them and came to me afterwards and spoke to me about them. The figures on the packages and in the report were undoubtedly fallacious, and I have asked that a committee of unbiased experts be appointed to take up this matter and make a report at the next annual meeting, so that the Association may know the facts in regard to this matter.

Mr. Kebler read the section of the report of the committee referring to this subject:

"Prof. V. Coblentz, in his address as Chairman of the New York Section of the Society of Chemical Industry, treated the matter of adulteration at some length, and submitted samples of aristol, trional, phenacetin, etc., that were spurious or largely adulterated. He has kindly presented them to this committee, and they will be submitted to the meeting with this report."

MR. CLIFFE: These samples were submitted and were in evidence there, and they were examined by numerous members of this Section, and I think, in simple justice to Mr. Beringer and those he represents, that this motion should pass.

MR. LOWE: It was also voted that these samples should be sent to Washington and be on exhibit there ever afterwards.

MR. ANDERSON: May I ask who is to pay the expense of this investigation?

MR. BERINGER: If the investigation is made, I will pledge myself to bear the expense. I want the Association to have the truth, the whole truth, and nothing but the truth. We have had circulated through the pharmaceutical and lay press so many accusations regarding the drug trade that I think the time has come to know the actual truth, and the whole truth, about these things. This defamation of character should stop, and for myself I feel that I cannot stand by one instant and let this accusation go unchallenged.

Mr. Beringer's motion was then put to a vote and carried.

MR. KREMERS: I now move that the balance of that report be accepted.

MR. BERINGER: Before that is accepted, I want to ask one question: Has this committee incorporated in this report anything but their own work? If so, we have no right to accept it. If it is merely garbled work from here and there, we have no right to accept it.

MR. GANE: The committee was bound to report not only the result of their own work, but the work of other members of this Association, as well as reports from all over the world. Among the things reported are the results of our own work, the results of work in foreign countries, and the work of members of this Association.

MR. BERINGER: I move that we adopt only that part of the committee's report which embraces work done by the committee itself.

MR. KREMERS: This motion, if carried, will convey the sense of this Section that hereafter only original work is to be published in the report of the committee, and that anything that smacks of a compilation is to be left out.

MR. HALLBERG: It seems to me that if the Committee on Drug Adulterations is to report the results of such examinations, and these results are to be published in the reports and journals generally, it should not report the names of the parties, nor should anything in the nature of the examined specimens be presented here. I am astounded to learn that a number of packages were presented at this meeting supplemental to this report of the Committee on Adulterations—samples of these articles which this committee certainly is not responsible for. Do they assume responsibility for the correctness of the analysis or examination of these specimen packages that were presented at this meeting? If they do not, we certainly have nothing to do with them. They should not be permitted to be distributed, or be shown in the meeting, unless the committee assumes full responsibility for the alleged analysis. That, it seems to me, is the only view we can possibly take on this question.

MR. LOWE: The action of this committee was entirely different from the action of Mr. Beringer. Mr. Beringer had some 140 samples of phenacetin, and a good many were purchased from reputable men, and yet some were adulterated. No names were presented in connection with that report, though, and there was no desire to harm any man's reputation.

MR. REMINGTON: I think it is proper that we should be very careful about this subject of adulterations. We should be very careful, indeed, in publishing results. One mistake, one act of injustice perpetrated by this Section, will certainly do a great deal of injury to the Association—even more injury to the Association than to the individual who is affected. Now we know that a great deal of harm has come from publishing the analysis of various makes of certain preparations which are on the market. I do not believe it is

either wise or judicious to publish anything of the kind—even for the pharmaceutical journals to do it—because this is often done by certain manufacturers for commercial purposes. We know enough about analysis to know that we are very apt to make mistakes, and much injury has been done thereby to the party affected. But further than that, it works in another way. I think it is sufficient for the Section or Association to know that certain adulterated products are on the market, and they should be designated by figures or in some other impersonal way. We want the facts, but this Association should not injure any one, particularly by way of analysis. You make an error in analysis and the fact is published, what recourse is there? It may be three months, or a year maybe, before you find out that some irresponsible person has made a mistake. Now the American Pharmaceutical Association is a responsible body, and can be sued for damages, and I think it is much the best for every reason that we should have simply the facts in the case, and that we should know that such a thing is adulterated, but we should be very careful about how we run the risk of injuring somebody's reputation through a mistake.

MR. LYONS: There is another reason why we should be very careful in this warfare we have been waging on adulteration. A single mistake has not only the effect of injuring individuals, but the very cause we are trying to foster. The moment it appears that we have gone beyond the truth we become persecutors in the public eye, and our object is frustrated. We are not respected for the attempt we were honestly making.

MR. ALPERS: How much injury the publication of an irresponsible analysis can bring about was shown last year in New York City. Those of you who live in New York have heard about the phenacetin war, and those at a distance have read the journals. A number of samples were bought, sometimes with the avowed intention of finding adulteration, and the stores that were inspected were visited with the idea of finding a large per cent. of adulteration in their goods. The result was, the whole drug trade was put under a cloud. When the thing was sifted, it turned out about like Mr. Beringer showed this morning; many of the samples claimed to be adulterated showed insignificant adulteration, probably the result of accident. Practically the same result was reached by the board of health; a great many of the samples contained as much as four per cent. of acetanilid! It is evident on the face of it, of course, that no man will be stupid enough if he wants to adulterate an article, to open the package and put 4 per cent. of another substance in it. If there had been 4 per cent. of phenacetin found in the package, and the balance acetanilid, there would have been some sense in it; but to call this adulteration and thereby reflect on the whole drug trade, was simply absurd, of course. The whole thing was brought about by careless or superficial analysis. We should, therefore, be very careful, and not publish anything that would cast suspicion on any body, whether manufacturer, wholesaler or retailer. [Applause.]

THE CHAIRMAN: The question is upon the amendment offered by Mr. Beringer, that we adopt only that portion of the report showing the results of the investigations made by the members of the committee.

The motion was so put and carried.

MR. CASPARI: Mr. Chairman, I would like to make a motion to the effect that the Committee on Drug Adulteration be instructed that, hereafter, when they bring in adulterated products, they bring them in such form as to virtually ignore the name of the maker or vendor, and simply designate them by name, as di-thymol di-iodide or phenacetin, or give them a number if they wish; particularly as they are to be kept in the museum of the American Pharmaceutical Association, we do not wish to have any pack-

age bearing the name of the manufacturer or vendor, and I think such instructions should be given the committee. The packages brought in this morning not only contained the the name of the manufacturer, but also the name of some man who had purchased them; also the name of the pharmacist and the name of the adulteration found. They were put in my custody for the future use of the American Pharmaceutical Association, and I think we should avoid all such conditions in the future.

Mr. Lowe seconded Mr. Caspari's motion.

MR. HALLBERG: In addition to that I would suggest that the Committee on Adulterations next year adopt the triplicate plan in collecting samples, similar to that employed by the German government; that is, every specimen that is collected for examination is divided into three equal parts and sealed in the presence of witnesses: one is left with the seller, one is retained by the purchaser for his examination, and a third party keeps the third one, sealed, for use when necessary. That is the only proper method of collecting samples, and no analysis should be made except under these conditions; and I am satisfied no lawsuit can be successfully maintained, if that point is raised, unless the prosecution can show that these conditions have been complied with.

MR. D'AVIGNON: In the Revenue Department of Canada they pursue the same course. Under our public health act it is done there in the same way as Mr. Hallberg suggests—one sample is taken by the seller, one by the examiner, and one is sent to the Government, at Ottowa, for examination. If the seller is not satisfied with the result of the analysis, he can have another made by an independent party, and if he can show that the first analysis is wrong, he has recourse against the Government examiner.

THE CHAIRMAN: As a member of the Committee on Adulterations for the State of Michigan, I have had some experience along these lines, and it seems to me it would not be wise to place too many restrictions on this committee. It is not a vacation to gather samples and make analyses. There are no salaries attached to all this work; it is a labor of love. Of course, if I was employed by the Government, I would be willing to undertake almost anything—would be willing to recognize a great many restrictions; but business men cannot afford to have too many restrictions put about them. I am sure I should resign from the Michigan board if such restrictions were imposed.

MR. MERRELL: It seems to me that information coming to the committee in any way would be valuable. The source of the information should be given, but of course no samples submitted or names given, but I think such information would be valuable in a report of that kind.

MR. KEBLER: Mr. Patch was chairman of this committee, and he evidently knows the situation. I was not a member of last year's committee, but I have been under the impression that the instructions of the Association have always been, ever since the committee was organized, to get material from every source possible. Now I myself have always pursued the policy, wherever a product was found of a character not up to the requirement, to first inform the manufacturer before anything was done, and if he could show good reason why it was adulterated or inferior, or below standard, I always thought he ought to be given another opportunity, and that the matter should not be made public. I confess I was somewhat surprised myself when I saw these packages with the names and results written out in the manner they were, although I am not chairman of that committee. I had not seen the packages before they came here.

MR. MAYO: All the criticisms which have been made of the report seem to be based entirely upon the introduction of names and the source of origin of the individual cases

of adulteration. Now I believe that the motion of Mr. Caspari covers that fully. As regards the original instruction of the committee, I happen to have been the mover of the resolution appointing this committee at St. Louis, and I know it was contemplated then that the committee should collect as much as possible, from every possible source, regarding adulteration. It is not probable that any three or four men could find the time to cover the entire field of adulteration, and if this committee's report is made sufficiently comprehensive to be a complete report every year, covering all the literature of adulteration, foreign and domestic, it will be very much more valuable than to try to limit it to the work of the committee itself. I do not think the gentleman who made the motion to restrict the report of the committee hereafter to the work of its individual members quite realizes what that means. I think the criticism that has been offered is quite a just one, and that criticism is fully covered by Mr. Caspari's motion, that the Committee on Adulteration be required to erase all names and marks of identification. I think that covers the ground entirely, and I hope the motion to restrict the work to the individual work of members of the committee will not stand. If we do that, it will minimize the value of the report.

The Chair stated that the motion to restrict had already been carried, and that the motion now before the house was that made by Mr. Caspari.

Mr. Kremers, acting Secretary of the Section, said he would like to read the motion as he had it written down, and read the following:

Moved by Mr. Caspari that the Committee on Adulteration be instructed hereafter to avoid the exposition of names of manufacturers and vendors in connection with the adulterated products.

The Chair then put the vote on the motion as just read, and it prevailed.

MR. MAYO: As a matter of information, I would like to ask about one point: As I understand it, that motion regarding the work of the committee—restricting the publication of the report to the work actually done by members of the committee—applies to this particular report. Now what about the future work of the committee?

MR. REMINGTON: I think this Section will be making a great mistake to do that. But I do not understand the motion as applying to all future reports—that the committee is not to embody instances of adulteration and compilation wherever found. I certainly hope that idea will not prevail. I am not in favor of the reports being limited in the future to the original work of the committee, for that would deprive this Association of a great deal of valuable information. For instance, I heard just yesterday a piece of information that will serve to illustrate this point: A consumer, or, at least, a person in the jobbing business, bought a hundred pounds of insect powder that was pure, and the first thing he did was to adulterate it with chrome yellow to make it more satisfactory to his trade. Yet the seller of that insect powder is liable to be pilloried over the country for selling adulterated insect powder. Now what we want to know are the facts; we do not care to know who does it. And so I hope that future reports of the committee will contain compilations that are recent and authentic, but which do not give the names of the parties, for the sake of peace.

MR. KREMERS: I am perfectly in harmony with the spirit manifested here this evening, not to publish the names of these parties. I have had occasion to eliminate papers from this Section that did contain names. But if it is valuable to have future reports of a compiled character, why should we exclude the work of this year's committee? Is it

not an injustice to the activities of this year's committee to cut out such a report? Will committees in the future bring in the reports we want, if we eliminate three-fourths of the report of the committee this year because it contains one thing we do not want? Let us eliminate what we should, but not everything.

MR. GOOD: I am in entire harmony with the remarks of Mr. Remington. I think we voted under a misapprehension, and as one who voted in the affirmative, I move a reconsideration of the vote whereby we decided to exclude from this report all but original work of the committee.

MR. HALLBERG: I would like to move as a substitute for that, that the editor of the report of our Proceedings be charged with discrimination in eliminating anything objectionable in this report for the present year. I do not think we can take up the whole evening here in discussing this question. We can trust Mr. Caspari to get that into shape, I think.

MR. CASPARI: Mr. Chairman, I object to that strongly. Do not put on the editor of the Proceedings the duty of editing and criticising the committee reports. Let the Section do that itself. The editor does not desire to do that.

Mr. Puckner thereupon seconded Mr. Good's motion to reconsider.

MR. ALPERS: There seems to be a misunderstanding about the purport of the vote taken on this subject. My understanding was, that the Association would not be responsible for the work that is described or recorded in the report of this committee, except so far as our own members were concerned: that the work of other investigators given in this report did not become work done by us, and we were not responsible for it. That was my understanding, and in that sense I voted for the motion. But to exclude everything we can gather on the subject would be foolish. The report of the committee should consist of two parts: first, the original work of the committee—and that we accept and agree with and become responsible for; second, information which the committee may gather, which is simply received, and, if necessary, printed, but for which we are not responsible: just as many things are published in the Report on the Progress of Pharmacy for which we are in no wise responsible. If that vote meant anything else than what I have indicated, I should certainly ask for a reconsideration, in order that it may be thoroughly understood just what we do mean.

MR. GOOD: That is a refinement which we cannot make. We are responsible for everything we publish. At the same time I do not think it is necessary to publish any names at all, even if we publish what we have copied. Mr. Caspari's motion covers that point. We had recently a forceful illustration of how this thing works. A certain newspaper published a very severe criticism on our Supreme Court, and another newspaper copied that publication. Both were fined for contempt, not only the original publisher, but the one who copied from him. Now we do not want to be put in any such position as that. What we do want, however, is to publish the facts and suppress the names.

THE CHAIRMAN: As the Chair understands this matter, Mr. Kremers first made a motion to adopt the balance of the report—that is, all that was left remaining after excluding the objectionable parts. Then Mr. Beringer offered an amendment providing that everything should be excluded that was not worked out by the members of the committee, and that amendment was adopted. Now the motion is to reconsider the action taken upon this amendment offered by Mr. Beringer, the motion has been duly seconded, and it will now be voted on.

The Chair thereupon put the motion to reconsider the vote and it carried.

THE CHAIRMAN: Now the original motion of Mr. Kremers is before us, which is, that the remaining part of the report be adopted.

MR. BERINGER: Mr. Chairman, I move to amend that motion to this effect, that in every case where there is a compilation the authority for such compilation must always be stated.

MR. GOOD: I think the names of those who are responsible for the adulterated articles should be suppressed.

MR. BERINGER: It seems to me we are about to establish a dangerous precedent. We do not permit any other committee to go ahead and collect and collate from all over the world, and why we should permit this committee to make such reports without qualification or restriction I cannot see. Suppose it takes the report of some health board, for instance, and publishes that as showing a case of adulteration, that is certainly no such work as we should countenance.

MR. KIRSCHGESSNER: We know how this was done in New York. Every doctor received a pamphlet every week—and they are receiving them every day. If you incorporate that in this report it will be taken down and sown broadcast.

MR. ANDERSON: Mr. Chairman, it appears to me that the amendment of Mr. Beringer that was carried is now before the house, and not Mr. Kremers' motion. As Mr. Beringer's amendment has been reconsidered, that comes up before the body again for action.

THE CHAIRMAN: I stand corrected. The question before the house is the amendment offered by Mr. Beringer.

Mr. Kremers, as acting Secretary, read the Beringer amendment again, as follows:

Moved by G. M. Beringer that only such part of the report of the Committee on Drug Adulteration as represents the actual work of the committee be accepted.

MR. CLIFFE: That refers simply to the report that we have been considering this evening.

The Chair put the vote on the motion just read and it was lost.

THE CHAIRMAN: Now the original motion of Mr. Kremers is before the house.

MR. KREMERS: My motion was that the balance of the report be accepted.

MR. REMINGTON: I think that that had better be extended—"that the rest of the report be accepted."

MR. GOOD: Every motion ought to stand alone, and I think we had better make a motion that will cover this subject and move that the report of the Committee on Adulterations, excepting that portion which pertains to the subject of aristol, be accepted, with, of course, the understanding that the names of those who are responsible for the adulterated articles shall be suppressed.

Mr. Kremers said that, as the original mover, he would change the motion.

MR. KEBLER: There are no names in this report at all. If you dispose of the samples that is an end of it.

Mr. Kremers' motion was then put and carried.

MR. GORDON: Now, Mr. Chairman, I move that the samples in question be destroyed.

MR. CASPARI: That cannot be done; the Association has adopted a motion that these samples be put into the hands of a committee of experts for examination and report next year.

THE CHAIRMAN: We cannot destroy them now.

The Chair said the Section would now proceed with the regular order, and called on Mr. A. B. Lyons to read a paper on Cannabis indica, which he presented in abstract, the full text being as follows:

## THE PHYSIOLOGICAL ASSAY OF CANNABIS INDICA AND ITS GALENICAL PREPARATIONS, WITH NOTES ON SOME OF THE COMMERCIAL PRODUCTS SUPPOSED TO REPRESENT THE ACTIVE PRINCIPLES OF THE DRUG.

BY L. W. FAMULENER AND A. B. LYONS.

For untold centuries Indian Hemp (Cannabis indica), which is indigenous to Persia and Northern India, has been used in that part of the world as an intoxicating and narcotic agent. Notwithstanding its extensive use in the East, this drug was not introduced to Western civilization until about one century ago, when its value as a medicinal agent was first recognized. The plant has become naturalized in the temperate zones, where it is extensively cultivated as a fiber plant. Hemp, however, is peculiar in the fact that only those plants which are produced in warm climates possess marked physiological activity.

The unfertilized flowering-tops of the female plant are the most active portion, and for this reason are designated by the Pharmacopœias as constituting the official Cannabis indica. Physiologically, this drug acts as an analgesic and narcotic similar to opium, but not so injurious in several ways. By many it is considered a highly valuable drug in the treatment of certain nervous conditions, but the uncertain degree of activity of its preparations in the past has prevented its use from becoming general. A drug of such marked action as hemp naturally invited chemical investigations, and it has been in fact repeatedly made a subject of analytical study.

*O'Shaughnessy, in 1839, was the first European who investigated Cannabis indica with any degree of scientific accuracy. He made an alcohol

* Trans. Med. & Phys. Soc., Calcutta, 1839.

extraction, and evaporated to dryness over a water-bath; the product was quite active physiologically. But the labors of the earlier investigators towards the isolation of the active constituents were attended with no marked degree of success until about the middle of the last century, when the first important step towards this end was made by T. and H. Smith,* of Edinburgh, in 1846. These investigators separated a purified resin from gunjah (unfertilized tops of the female plant), which they claimed possessed the physiological properties of the crude plant. The name "Cannabin" was applied to the new substance. Recent researches have partially substantiated the claims of these early workers.

Other workers followed with varying results. Preobraschinsky, in 1876, reported a volatile alkaloid which he believed to be nicotine; Dragendorff soon after pointed out the possibility that nicotine might be found in certain samples of the drug, since tobacco was often mixed and smoked with hemp in the Orient. At different times various investigators reported the presence of other alkaloidal bodies in the drug. Hay † believed that several alkaloids were to be found in the plant. He isolated a crystalline substance in minute quantities, which he called tetano-cannabine, and claimed that it produced a tetanizing action when administered to animals. Jahns,‡ however, suggested that the body was probably identical with choline, which he himself had found during his research upon hemp. Since choline differs in its crystalline form from the substance which Hay described, as well as in its physiological action, Jahns' explanation cannot be accepted. Alkaloidal bodies reported by other workers failed to correspond with any of those previously described; all of these bodies were found only in minute quantities, and none possessed the identical physiological action of the drug. In view of these facts it is very questionable if the characteristic action of the drug is due in any appreciable degree to bodies of alkaloidal nature. Rather, the basic bodies may be looked upon as decomposition products of the original constituents of the plant.

Another group of investigators believed that volatile substances were present in the drug to which its action was partially, if not wholly, due. These beliefs were supported by the claim that inhalation from fresh hemp produced a definite narcotic effect upon the system. As early as 1857 Personne § investigated the volatile oils by means of distilling water from large quantities of hemp. He succeeded in getting a volatile, amber-colored oil which was specifically lighter than water. Upon further examination he found that this material was composed of two distinct hydrocarbons, one a colorless fluid, which he called "Cannabene;" the

* Pharm. Journ., 1847.

† Pharm. Journ. Trans., June, 1883.

‡ Arch. d. Pharm., June, 1887.

§ Journ. Pharm., 1857.

other a solid, "Cannabene hydride." The cannabene was said to produce marked nervous symptoms when either inhaled or taken by stomach. The latter oil has since been shown by Vignolo (1895) to be an impure sesquiterpene.

In 1894 Kobert * reported a substance which he had separated from Cannabis indica. It was a dark red, heavy liquid, and possessed a pronounced narcotic action in relatively small amounts; he gave it the formula $C_8H_{12}O$, and designated it "Cannabindon."

One of the latest, as well as most exhaustive, researches upon hemp has been performed by T. B. Wood, Spivey, and Easterfield,† who jointly reported their results in 1896. These investigators worked upon "Charas," a natural, resinous exudate, separated mechanically from the hemp plant. This important work yielded four distinct chemical compounds.

1. A terpene ($C_{10}H_{16}$), boiling at 160°–180°.
2. A sesquiterpene ($C_{15}H_{24}$), boiling at 258°–259°.
3. A paraffin ($C_{29}H_{60}$), melting point, 63°–64°.
4. A toxic red oil ($C_{18}H_{24}O_2$), boiling at 265° under a pressure of 20 Mm.

The physiological properties of these newly isolated substances were investigated by Dr. C. R. Marshall.‡ In his report he stated that the terpenes closely resembled other members of the same class in physiological action. But, on the other hand, he found the "red oil" very active, and when administered in doses of 0.5 Gm. induced decided intoxication followed by deep sleep. He concluded that the red oil must be considered the active constituent of the plant. In view of these results we may conclude that the sesquiterpene was probably a constituent of Personne's "Cannabene," and identical with an oil separated by Valenta (1880), and one separated only a short time before by Vignolo (1895). The paraffin found corresponded to Personne's solid "Cannabene hydride." While the red oil was a purer form of cannabindon ($C_8H_{12}O$) described by Kobert, and, also, by Lapin.§

The original investigators consider the red oil a hydroxyl derivative, and proposed the name "Cannabinol" for the new product.

If cannabinol does in truth represent the physiological activity of hemp, it must be present in all the pharmaceutical preparations which are known to exert the characteristic effect. Accordingly, several preparations of cannabis were examined by the authors and the cannabinol determined in each. Smith's cannabin yielded as much as 80 per cent., Merck's cannabinon gave 50 per cent., while other preparations afforded smaller quantities. From the chemical side this research is by far the most val-

* Chem. Zeit., 1894, 741.

† Jour. Chem. Soc., vol. 69, 539.

‡ Am. Med. Jour., 1898, ii, p. 882.

§ Dissertation Jurgen, 1894.

uable that has been made. It seems certain that cannibinol (red oil) contains the active constituent of the drug in a more or less pure form, and brings us near to a solution of the chemical problem. Further investigation is, however, necessary before we arrive at the bottom facts with regard to this perplexing subject.

It has been a matter of experience as well as scientific observation that the crude drug and its preparations are variable in strength, and prone to a gradual loss of activity. Some samples are found to be extremely active, while others are practically inert. The character of the soil and the geographical area where grown, influence the activity of the plant primarily; time when gathered, and age of the drug enter secondarily as factors controlling the real value of the drug. Dr. Train states that the crude drug deteriorates rapidly with age; one-year-old drug is only one-fourth as active as the fresh, and after two years it is practically inert. Dr. Marshall in his investigation upon cannabinol, found that that substance readily underwent superficial oxidation when exposed to the air, and when thoroughly oxidized, as by a stream of oxygen being passed through the warmed material, it became darker colored, and upon testing, he found it to be physiologically inert. Cannabin (Smith) and cannabindon (Lapin) undergo the same changes when exposed to the air. Oxidation of the active constituents has been offered as an explanation for the rapid loss of power in the crude drug and its preparations.

Since the lack of uniformity in the Cannabis indica products has often led to serious consequences in the hands of the practitioner, it is imperative that the drug be standardized by some means. The results of the research of Wood, Spivey, Easterfield and Marshall seem to place almost within our reach a chemical means of determining the therapeutic value of different preparations of Cannabis indica. The details of an assay process remain, however, yet to be worked out. The method of distillation under reduced pressure is not suited for a drug-assay process, and it is not yet certain that a product obtained by such distillation is constant in composition or uniform in activity. It is certain that it loses activity by oxidation, and the experiments reported indicate that in the various preparations of cannabis it has in fact undergone more or less oxidation. Thus while the product from Charas contained 9.06 per cent. (8.9 to 9.29) of oxygen, that from Smith's cannabin, as also that from Merck's cannabinon, contained 9.6 per cent. It is therefore probable that the percentage of red oil obtained would not after all indicate truly the narcotic strength of the preparation.

On the other hand, it is possible to standardize this drug and to determine the relative activity of its preparations with a high degree of accuracy by physiological methods carried out upon certain animals. Before taking up this method in detail it is necessary to have an understanding of the pharmacology of the drug, in so far as it has a direct bearing upon the subject. The action of the drug is exerted principally upon the central

nervous system, in which changes are induced causing a peculiar train of symptoms. In man, soon after the administration of a large dose, a dreamy, semi-conscious condition is induced, the imagination runs on unchecked, vision-like dreams intervene, disconnected ideas rapidly flash through the mind, and the faculty of estimating time and space is lost. The patient usually experiences a stage of exhilaration, but may be in just the opposite mental state. Much difficulty may be encountered in the attempt to walk or to maintain proper balance of the body, and a loss of sensation in the muscles of the extremities is experienced. In speaking, a sentence may be left incompletely finished or much disconnected. At this stage periods of unconsciousness may alternate with the dreams; finally the patient passes into quiet, deep sleep, from which he later awakens refreshed and usually feeling none the worse for his experience.

The same general symptoms seem to be induced in the lower animals, particularly those of higher cerebral development. The dog is especially adapted for the testing of the drug. In this animal it is impossible, of course, to know what are the subjective symptoms. The objective signs, however, can be definitely recognized. Heavy doses ordinarily induce a period of exaltation, which is followed by depression and sleep. The first symptom, which appears some time during the first two hours, may be noticed as a condition of slight lassitude, dulled attention, yawning, drowsiness; sleepiness increases; the animal's body when he is standing sways from side to side or antero-posteriorly; the feet are widely spread to maintain balance; a distinct ataxia is present when walking. Upon being spoken to sharply the animal may recover himself and remain steady for a short period, but after a few moments again relapses into the former condition. Vomiting is occasionally one of the earlier symptoms, especially when the dose has been very large. As the drug action gradually progresses the muscular incoördination becomes greater, the depression and lassitude are increased, until finally the animal sinks to the floor as if exhausted, and passes into deep, undisturbed sleep. After the fourth or sixth hour the animal ordinarily begins to recover from the drug action. He awakens, and usually becomes playful, running about, barking, etc., if especial attention is shown to him.

In the physiological assay of Cannabis indica, advantage is taken of the marked symptoms manifested by the dog, and the doses are so graded that the minimum amount which will produce a certain "end-reaction" is ascertained. The end-reaction which is to be obtained in practical work, is an action just sufficiently pronounced to produce muscular incoordination in the subject. This is distinguished by a gentle swaying of the body while at rest, and a slight ataxia in walking. The subject (dog) for assay purposes should be selected with care—an intelligent, quiet, healthy dog; then closely study, under normal conditions, peculiarities noted, etc., until the operator is perfectly familiar with its individuality, as it were.

Experience has demonstrated that different varieties of dogs do not react equally to the same amount of a given sample of drug, even if they are of equal weights. Weight of animal is of relative importance, but not such an ultimate factor as is the case in the assay of the heart tonics in frogs, yet it bears an approximate relation, and must be constantly taken into consideration. In order to establish a "provisional standard," a number of samples of best crude drug (or fluid extract) are taken and each one assayed separately upon the same animal; the results are averaged, and a preparation selected as of "standard strength." Other animals may be standardized by means of the standard-strength preparation, and the relative strength of other samples is then determined by comparison with this.

The mode by which a drug is prepared for administration is of some importance. In case the crude drug is to be tested a finely ground, uniform sample is taken, a definite amount weighed out, and completely exhausted by percolation with strong alcohol. The alcohol is removed by evaporation at a gentle heat, and the extract is thoroughly triturated with sugar of milk in order to separate the substance into as minute particles as possible. Sufficient syrup may be added to make the mass soft. The mass should be divided into portions so that each one shall not represent more than one-eighth gram (less is preferable) equivalent of the original crude drug. The soft mass facilitates rapid disintegration in the alimentary tract, and consequently is more readily absorbed in the intestines. Solid and powdered extracts may be made directly into mass; fluid preparations converted into and treated the same as the extracts.

Granting that the operator is perfectly familiar with his animal, he should prepare the subject by only allowing such food as is readily digestible, and that not in abundance. All food should be withheld for at least four or five hours previous to the time that the drug is to be given, but water should be allowed. The dose is given by mouth without difficulty. After the dose is given the animal should be undisturbed in order to prevent excitement, but careful observation should be made occasionally throughout five or six hours, and results recorded. The dose should be increased or decreased in successive experiments as the operator finds necessary. In case a very pronounced action is produced, by a heavy dose or exceedingly active drug, the animal should be allowed fully twenty-four to thirty-six hours to recover normal condition before repeating the test. On the whole, it is better to use an animal only upon alternate days, thus giving sufficient time to recover and to fully eliminate the drug from the body. When the line of demarcation is found which separates the minimum dose producing the end-reaction and that which causes no muscular incoördination, the dose may be repeated to confirm results. This method requires time and close attention, but in the hands of an experienced operator results can readily be had which show a dis-

tinction between quantities differing only by one-sixteenth gram of active, crude drug; this is all that is necessary for practical purposes of assay.

It has seemed to us worth while to make an examination of a number of commercial preparations by this method of physiological assay. In all cases the drug was gotten directly from the manufacturer where possible, in order to insure freshness of the article. Two small dogs of practically the same size and weight (18 and 21 lbs.) were standardized by means of a standard fluid extract; the minimum dose which gave a symptomatic end-reaction was 0.75 Cc. equivalent in each animal.

### FLUID EXTRACT.

Three preparations from different reliable manufacturing houses were procured. From each sample a definite amount (10 Cc.) was accurately measured out, placed in a shallow evaporating dish, and the alcohol removed by means of gentle heat. The residue was thoroughly triturated with sugar of milk, and sufficient syrup added to form a soft mass. The mass was divided into portions, each of which was equivalent to one-tenth cubic centimeter of the original fluid extract. The relative strength was determined by the method which is outlined above. Two of the samples assayed equal strength (0.75 Cc. equivalent), while in the third case over two and one-half (2.0 Cc.) times the amount was required to produce the same effect. The wide variation shown by the last sample was probably due to an inferior drug used in its manufacture. That the fluid extract does not deteriorate rapidly with age we have shown by testing the same sample when freshly made, and afterwards at intervals of twelve months, finding no appreciable change in strength.

### TINCTURE.

This preparation, although official, is little used, and is certainly superfluous. It is very commonly made, we have reason to believe, by diluting the fluid extract. We have, therefore, not thought it necessary to examine commercial samples of the preparation.

### SOLID EXTRACT.

Two different samples of this preparation were assayed. A definite amount (1.0 Gm.) was weighed out, thoroughly triturated with sugar of milk, and then made into a soft mass with syrup; this mass was divided so each portion was equivalent to 0.01 Gm. of the original solid extract. Of one sample there was required 90 Mg., while of the other there was required only 70 Mg. to produce end-reaction upon the standardized animal.

### POWDERED EXTRACT.

These samples were examined, all of which contained evidently much inert absorbent material. The labels on two of them stated that the prep-

aration was twice the strength of the crude drug. Since the yield of ordinary extract is not more than 10 or 12 per cent., it is evident that there is room for a good deal of inert substance even if the preparation is all that it claims. Our test showed, however, that only one of the samples came up to this seemingly low standard. The minimum dose should be 0.37 Gm. to meet this requirement. In sample "a" this quantity just sufficed to produce the effects sought. Of sample "b" it required 1.2 Gm. to produce the same effect, while sample "c," in doses of 1.5 Gm., was apparently inert.

Sample "b" was one which, when examined six months earlier, had produced an effect in the theoretical dose. It had evidently deteriorated very greatly. This is only what we might expect if deterioration is the result of oxidation. We conclude that a powdered extract is not a preparation to be depended upon.

### CANNABINE TANNATE.

Cannabine tannate is a yellow or brown powder, with a slightly bitter but strongly astringent taste. A definite amount of this preparation was weighed out, triturated with sugar of milk, and extract of licorice added in sufficient amount to form a mass when syrup was added. It was given to an animal in gradually increasing amounts until a dose to two grams was reached, but no action whatsoever was produced. The sample, the same as the following preparation, was received direct from the manufacturer, which fact should be a guarantee of its freshness. Obviously the preparation has no value as a therapeutical agent.

### CANNABINON (10 PER CENT. ABSTRACT).

This substance appears as a coarse, dark-brown powder, with a slightly bitter, astringent taste, but practically no odor. Definite amounts of this material were weighed out and made into doses in the usual way. Doses of one gram failed to produce any definite action upon the test animal. In view of the costliness of the preparation, it was not deemed necessary to carry experimentation with it further. Practically it is worthless.

### CANNABIN (RESINOID).

In physical appearance this preparation closely resembles the ordinary solid extract. It is a black semi-fluid, with the characteristic odor of hemp, but without any particular taste. A definite amount was weighed out, dissolved in a few drops of alcohol, in order to produce uniformity upon triturating with sugar of milk. To the triturate sufficient extract of licorice was added to enable a formation of mass with syrup. The mass was divided into definite portions, which were given to the animal in the regular manner. It was found that 75 Mg. induced the characteristic end-reaction upon the standardized animal. It is thus a little more

active than the ordinary solid extract, but the latter is surely to be preferred on the ground of economy. It seems to be a very similar preparation to T. & H. Smith's cannabin.

CONCENTRATION CANNABIN.

The sample examined was a dark-brown granular powder, having the odor of fresh hemp and a bitterish, decidedly sweet taste, suggesting the presence of glycyrrhiza. The label states that "2 grs. is equivalent to 1 gr. standard," whatever that may mean. Doses of this preparation up to 1.5 Gm. administered in the usual manner, produced no effect. We found that about 25 per cent. of this "concentration" was soluble in water, while only 23 per cent. consisted of alcohol soluble "resin."

TABLE EXHIBITING RESULTS OF THE EXPERIMENTS.

| Preparation. | Minimum Dose.* | 1 Gm. (or Cc.) equiv. to standard drug. |
|---|---|---|
| Crude drug (standard) ..... | 0.75 Gm. | 1.00 Gm. |
| Fluid extract, "a" ..... | 0.75 Cc. | 1.00 Gm. |
| " "b" ..... | 0.75 Cc. | 1.00 Gm. |
| " "c" ..... | 2.00 Cc. | 0.37 Gm. |
| Standard tincture. ..... | 5.00 Cc. | 0.15 Gm. |
| Solid extract, "a" ..... | 90 Mg. | 8.33 Gm. |
| " "b" ..... | 100 Mg. | 7.50 Gm. |
| Powdered extract, "a" ..... | 0.37 Gm. | 2.00 Gm. |
| " "b" ..... | 1.20 Gm. | 0.62 Gm. |
| " "c"† ..... | — | — |
| Cannabine tannate‡ ..... | — | — |
| Cannabinon (10% abst.)‖ .... | — | — |
| Cannabin (resinoid) ..... | 75 Mg. | 10.00 Gm. |
| Concent. cannabin§ ..... | 2.00 Gm. | 0.37 Gm. |

As a result of our experiments we conclude:

1. The only preparations of Cannabis indica which can be recommended are the fluid extract and the extract. Both of these are stable preparations, and if made from fresh Indian hemp of good quality, are to be dedepended upon. The tincture is probably equally stable, but it contains a needless amount of alcohol, and presents no advantage whatever over the fluid extract.

2. None of the preparations which purport to represent in concentrated form the activity of cannabis can be recommended. Most of them are practically inert. The few that have activity are relatively far more costly than the official preparations.

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* Smallest quantity of preparation that causes characteristic symptoms.

† A dose of 1.5 Gm. produced no effect.

‡ Two grams gave no action. ‖ One gram gave no action.

§ This preparation is labeled, "2 grs. represent 1 gr. standard."

3. Powdered preparations of Cannabis indica are too easily oxidized to be of any value. Most of them are nearly inert.

4. The only method known for determining the relative strength of preparations of cannabis is the physiological method.

5. This method is capable of yielding quantitative results sufficiently exact for all practi al purposes.

MR. CASPARI: I would like to ask Mr. Lyons if he has tried exposure in the open air to the heat he mentions of over 100 degrees centigrade, and if so, if he did not find the preparation to deteriorate? That has been the experience of others, I understand.

MR. LYONS: That is an interesting point; I have not tried that experiment, and was not aware of it.

MR. CASPARI: In England, after numerous experiments made in the evaporation of liquid preparations of Cannabis indica, it has been found that, even on a water bath, the preparation materially deteriorates by oxidation, showing that exposure to air is bad.

MR. HALLBERG: In my experience years ago in making the saccharated extracts, involving the desiccation of the extract of Cannabis indica in order to produce a pulverulent mixture, we found that the heat required caused a volatilization of the oil, which was given off in the form of whitish vapors.

Mr. Caspari, seconded by Mr. Gane, then moved that the paper be referred for publication, and it was so ordered.

MR. WHELPLEY: Mr. Chairman, I feel almost like asking for a vote of thanks to the author of this paper on account of the short, concise and intelligent abstract he has given us of a long and valuable paper. [Applause.] It is a good example for those who are to follow.

Mr. Lowe said he would second this motion, and it was carried unanimously.

Mr. Sayre then presented the following paper in abstract, being applauded upon his presentation of his subject:

## GREATER ACCURACY IN THE DESCRIPTION OF CRUDE DRUGS.

L. E. SAYRE.

Some ten years ago the writer was appointed as a member of a committee to study the histological characteristics of vegetable drugs with a view to their more perfect identification. One of the results of this work —perhaps not the least important—has been to impress him with the value and importance of the study and its wider application. To extend the interest, and to make a recognition of its importance more generally accepted, will take, possibly, a long time. It may further this desirable end if the subject be presented for occasional discussion in this Section in the American Pharmaceutical Association.

If we were asked to state, in a few words, the advantage of extending the description of crude vegetable drugs beyond the identification of their

gross characteristics, it would be difficult to give an answer that would satisfy one who has not been placed where the terms employed for their gross characteristics were inadequate to detect adulteration and sophistication. The older method of identification and analysis, if you please, utilized terms expressing qualities that referred to color, odor, taste, length, breadth, thickness, fracture, and, in a very few cases, terms which apply to the coarser microscopical qualities. In the barks, for instance, we have recognized the character and arrangement of the bast cells. By the latter means we are enabled to distinguish, quite satisfactorily, between, for instance, the two species of viburnum—the opulus and the prunifolium—even when the bark is in fine fragments. But we would call attention to the fact that even this much of accuracy of description is not recognized by our standard works that appeal to the profession at large. Although it may be difficult to convince many, outside of a limited circle, that these crude descriptions are no longer fully satisfactory, we desire to present to those who are open to conviction a few plain, perhaps not new, statements and, possibly, recommendations, with a view to extending the interest, at least, in this important work. It is gratifying to note, in passing, that the interest in pharmacognosy is growing, and the workers in it are becoming more and more efficient every year.

It is self-evident that the greater number of qualities one can associate with an object to be described, the greater the chances for accuracy of description. Especially is this the case when the object to be described may deviate greatly from the normal or typical specimen. If we take again, for illustration, the two viburnums, in the gross characteristics, we find the following facts: Both barks come in quills; they are not accurately distinguishable by either length, breadth or thickness. The outer portion of each exfoliates easily. As to color, the younger portion of the prunifolium is purplish, but the bark from the older branches of the prunifolium resembles a portion of the bark of the opulus. As to the internal color of the two, it is as the difference between reddish-brown and brownish-red. Occasionally in some fragments of the prunifolium we will find a predominant yellow, not distinguishable in the opulus. As to the fracture, it is brittle in both barks; somewhat tough in the older barks of the opulus. The odor of the prunifolium is said to be faintly valerian-like, but that of the opulus is inodorous. I do not wonder that some authorities claim that the odor of the prunifolium is slight or none. The fact is, in order to catch the slight valerian-like odor, it is oftentimes necessary to confine a a large bulk of the drug in a container. The point we wish to make is this, that in order to describe the two viburnums, or to distinguish between them, it is impossible to do it satisfactorily, for all practical purposes of the pharmacist, by confining one's self to the gross characteristics, even if these were constant, but as these are, within limits variable, it becomes impossible. If we add to these the grosser microscopical qualities we find

another chance of recognition. In the case of V. opulus, we find under the microscope bands of bast fibers predominating, in V. prunifolium we find groups of roundish or ovoid stone cells. Here we have found an essential and specific characteristic, and it makes the identification almost complete. Now what is true of one drug is likely to be true of another, and many others. If, therefore, we seek to discover an increased number of essential qualities, the greater is the opportunity for accuracy in description, and the advantage of this greater accuracy must be apparent.

But is such accuracy essential or necessary in practical pharmacy? Does it bear directly upon the business side of the profession? The practical pharmacist would not take kindly to mere ornamental frills in his calling? While we claim that it has a most important practical bearing upon the business side of pharmacy, we recognize it is difficult to convince those who have not been brought face to face with present conditions regarding adulteration and sophistication in crude and powdered drugs, and with the inadequacy of the old method to cope with these. We claim that, in order to meet the new conditions, we are obliged to hasten—as speedily as possible—this new technique in drug identification, where we shall not so much depend on color, which is most confusing, on odor, which appeals to a sense organ not to be depended on, in short on gross characteristics, which are no less confusing because of great variation.

We might illustrate our point by numerous examples of drug admixtures and their examination, but this would prolong this paper unduly, but we would simply ask the question in passing, how could the admixture of India senna with Alexandria senna in powder be detected except by availing one's self of the compound microscope, and studying the histological elements. Gross characteristics would be here of no avail. The same is true, using the former example, if viburnum opulus be mixed with viburnum prunifolium in powdered form.

A study and recognition of the histological elements is the only possible means of distinguishing them. When we consider that the crude drug, especially in the contused and powdered form, is likely to be adulterated, the necessity we have urged becomes apparent. One authority, referring to the market supply of some of our crude drugs, said: "Adulteration is the rule rather than the exception." In conversation with a well-known investigator, we were informed that if he desired certain drugs for experimental purposes it was absolutely necessary for him to collect the drug himself, or to grow it in his garden, then to dry and powder it himself. This statement does apply to certain indigenous drugs that are often gathered by ignorant and careless collectors. We have met with this carelessness frequently in the collection of, for example, Echinacea angustifolia. Not infrequently a large percentage of the drug will come to us mixed with E. purpurea. This same ignorance on the part of the inexperienced leads to gathering other foreign plants to increase the bulk. Some time

ago we had quite a considerable amount of poke-root sent to us mixed with stillingia. The sophistication was doubtless not intentional, but the result of inexperience and carelessness. These remarks do not apply as much to such old standard drugs as gentian, columbo, etc., yet we have had sent us from reputable stores bottles labeled tincture of columbo which, on examination, proved to be nothing more nor less than tincture of frazera—the druggist who made the tincture proving himself defenseless against the jobber who sold him the crude drug from which the tincture was made. Naturally those who market these sophisticated drugs take every care to conceal the fraud, and we are helpless against such practices if we do not bestir ourselves to make more general the recognition of the new technique. To do this, we should urge that it be made compulsory that our young men, in preparing for pharmacy, be required to have proper training in this branch of pharmacognosy. We should do all in our power to second the work of instructors, investigators and helpers, who are developing in this histological work. Finally, it is fair that we urge that our State Board of Examiners take hold and help, by requiring that the licentiates in pharmacy shall know, at least, the definition of many of the new histological terms so useful in accurate drug description.

If I have made myself clear in urging the more accurate description of drugs, it remains for me to point to the most encouraging fact that we have already developed along these lines quite a respectable literature on the subject. I need not refer to many of the excellent papers and monographs upon the histological elements in crude and powdered drugs, but during the past year two of our members have issued most helpful volumes upon this subject. I refer to the following books: Powdered Vegetable Drugs, by Albert Schneider, M. D., Ph. D., and A Course in Botany and Pharmacognosy, by Henry Kraemer, Ph. B., Ph. D. Former monographs and hand-books have been published, and another is to appear in London in a few months. Thus we shall have in a short time a most valuable literature, and it is our duty that it be well received and faithfully utilized by the rising generation of pharmacists.

In connection with this subject, we have endeavored to ascertain how far the various pharmacopœias have adopted this new technique—this greater accuracy of drug description. In looking over the latest issues of the British, French and German pharmacopœias, we find that they have been very conservative and cautious. Except in a very few cases have either of these pharmacopœias given us accurate descriptions of crude vegetable drugs and their powders by applying the histological terms which relate to the microscopical elements. In the French Codex and in the German pharmacopœia we find occasionally in the description of some of the important drugs as cinchona, ipecac, etc., reference made to size and form of starch grains, the characteristics of the cellular elements, etc., such

as can be determined only by the aid of the compound microscope. Why is it that these standard works are not, apparently, more progressive? They barely commend, much less promote, the reform steps that science seems to be taking. I think the explanation can be found in the fact that these standard works, the pharmacopœias, can hardly afford to be aggressive, or seem to lead, but safely follow the path which science marks out as desirable. Not until pharmacy, in the aggregate, is progressing toward this reform can the standard works safely adopt it, because it would lack the support upon which they are so dependent. Another reason for this lack of support on the part of the pharmacopœias is unquestionable, because of the existing imperfection in which this new technique is involved. Good as it is, it is still in the experimental stage. No one who has devoted his time and attention to the subject can claim the technique is perfected, but we are accumulating material quite rapidly, and the multiplying contributions to the subject accelerate the march of progress in it. Let us hope, that in the accumulation of material, in more accurate drug description, we will in time add a new meaning to the word drug-characteristic. Let us hope that it will result in an unmistakable identification of the pure drug, and in the detection of adulteration, as surely as chemical analysis will do this in inorganic drugs.

Mr. Rusby: Mr. Chairman, I take great pleasure in moving that that paper be accepted and referred for publication. It is a very great and common mistake to suppose that it is difficult or uncertain to identify vegetable drugs by their cellular elements; it is quite the contrary. If we could imagine ourselves standing on a dock surrounded by a large number of barrels containing fish, it would be reasonable to suppose that the man on that dock engaged in shipping the fish would be able to tell by looking at the barrels what kind of fish they contained. We might not be able to do so, but if we had a chance to turn the fish out and examine them we would have no difficulty in telling. It is precisely the same way as to the cellular identification of drugs. The cells are small, but there are greater differences between the cellular elements than between the crude drugs themselves in many cases. For this reason I think we are indebted to Mr. Sayre for this paper. I think it is well sometimes to have old subjects put before us in this way. It has only been about twenty years ago that instructions were given to a Committee on Revision that they should not recognize any drugs that could not be seen, because, it was stated, it would upset all systems of classification. Now in the issue of the Pharmacopœia that is coming we are going to introduce some powdered drugs, and I don't believe those of us who are in practical business can afford to ignore the advantages in the identification of drugs by the microscope.

The Chair stated that, without objection, the motion of Mr. Rusby to accept and refer would prevail, and it was so ordered.

Mr. Lyons being called on then read the following:

## AN IMPROVED GENERAL METHOD FOR THE ASSAY OF ALKALOIDAL DRUGS.

BY A. B. LYONS.

Keller's general assay method has been widely accepted as the most practical yet proposed. A convenient quantity of the drug in fine powder is introduced into a flask with ten times its weight of an appropriate ethereal solvent, in most cases a mixture of one part of chloroform with about eight of ether. The solvent is given time (ten minutes) to penetrate thoroughly the cellular structure of the drug, solution of ammonia is then added, and the flask is frequently shaken during a specified time, generally four hours, water is then added just sufficient in quantity to cause the drug to cake together leaving the ethereal fluid quite clear, and of this there is then decanted a certain aliquot portion from which the alkaloid is extracted by shaking out with dilute acid.

Experience has shown that in most cases the alkaloids are almost wholly dissolved out of the drug by this procedure, even when the drug is in a powder no finer than No. 30. Duplicate assays generally agree well, and the yield of alkaloid is in most cases quite as large as in assays by other methods.

There are, however, some theoretical objections to the method. The most serious of these depends upon the solubility of ether in water, and conversely that of water in ether. We all know that when a given volume of ether is shaken with a given volume of water each fluid dissolves a portion of the other, so that the volume of the ethereal stratum is changed. Since commercial ether contains a variable quantity of alcohol, the change in volume will not be always the same. Further, the ether and alcohol which dissolve in the water tend to hold the alkaloid in the aqueous solution.

Another source of error in the aliquot part is found in the volatile nature of the solvents used. In warm weather it is impossible to avoid some loss by evaporation, so that the aliquot part taken is too large.

In this country the Keller method is generally modified by substituting parts by volume (of fluids) for parts by weight. The exactness of the aliquot is still further compromised by this practice.

W. A. Puckner has described a modification of the Keller method which avoids the use of the aliquot part. He uses only one-half of the ethereal solvent for the maceration, and after the usual maceration transfers the drug to a small percolator, in which, after the ethereal solution has been well drained off, the marc is percolated with the same menstruum to complete exhaustion. The quantity of ethereal solvent required is not materially greater than in the Keller method, while the quantity of alkaloid obtained for weighing or titrating is larger, because it represents the whole of the sample taken for the assay. In the case of drugs containing a very small proportion of alkaloid this is an important advantage.

The objection I find to this plan is that the transfer of the marc from the flask in which the maceration has been conducted to a suitable percolator, which should not be more than 2 Cm. in diameter, requires very dexterous manipulation or it will be attended with loss of alkaloid.

I have been practising with a good deal of satisfaction a different modification of the Keller method, which seems to me less open to objection than any heretofore proposed. The plan is the very obvious one of packing the drug at the outset in the percolator, having previously moistened it with an appropriate menstruum of which an alkali forms a part. In some cases it may be best to moisten the powdered drug first with an aqueous solution of potassium bicarbonate, dry at a gentle heat or by spontaneous evaporation, introduce into the percolator with or without moistening according to circumstances, and percolate slowly with the appropriate ethereal menstruum.

The method, however, which seems to be the most generally useful, is as follows: Provide a cylindrical percolator about 20 Cm. in length and 2 to 2.5 Cm. in internal diameter, ending in a tube 5 Cm. long and about 3 Mm. in internal diameter. A glass stop-cock in the tube would be a very desirable improvement. In absence of this the rate of flow of the percolate must be controlled by packing the tube more or less firmly with absorbent cotton, or by closing the orifice with a nicked cork. Since the solvent is to be a very mobile fluid, the packing should generally be quite firm.

Having prepared the percolator, moisten the drug (5, 10, 15, 20 Gm. or more, according to richness in alkaloid—the finer the powder the better) with a mixture of ammonia, alcohol and ether-chloroform, the proportions of which will be somewhat varied to suit different drugs. If 10 grammes of such a drug as belladonna leaf are to be used for the assay, the mixture may consist of: Stronger water of ammonia, 1 Cc.; alcohol, 4 Cc.; ether-chloroform (6 : 1 vol.), 5 Cc. Moisten in a small evaporating dish, transfer quickly to the percolator, pressing the powder down firmly with a glass rod. The small amount of powder that remains adhering to the dish, spatula and glass rod can be easily transferred to the percolator by aid of a little absorbent cotton, which is finally pressed down upon the powder. The percolator is then to be covered, and allowed to stand 5 to 10 minutes so that the ammonia may thoroughly permeate the drug. A mixture of ether and chloroform, or whatever solvent is best suited to the extraction of the alkaloid present, is next added and the powder percolated with it to exhaustion. It is easy generally to secure a rate of flow of one drop per second which will insure thorough exhaustion by the time that 50 to 75 Cc. of percolate has passed. When it is believed that the exhaustion is complete, test this by collecting 15 or 20 drops, stirring this with a drop of normal sulphuric acid, evaporating off the ethereal solvent and testing the acid solution with Mayer's or Wag-

ner's reagent. From this point the assay is to be carried on in the usual manner.

The method may be modified in some cases by placing the powder in the percolator dry, introducing over it a little absorbent cotton, moistened with water of ammonia, closing the percolator for ten to thirty minutes, and then proceeding to percolate with ether-chloroform. Other modifications will suggest themselves as worthy of trial in case difficulty is experienced in following the routine described. It might be advantageous in some cases to moisten the drug at first with a solution of lead subacetate, dry it, and then treat as above. Possibly a dilute solution of ferric chloride might be preferable sometimes to the lead solution; but, as a rule, the method as described is quite satifactory, exhausting the drug very completely, and requiring very little time to carry through.

The Chair stated that, without objection, the paper just read would be referred for publication, and called on Mr. Hallberg to read a paper he had prepared on the lost art of plaster-making. Mr. Hallberg presented his subject, as follows, receiving the applause of his audience:

## THE LOST ARTS.—PLASTERS.

BY C. S. N. HALLBERG.

The advent of the rubber plaster, said to have been first manufactured in Lowell, Mass., made plasters at once a merchantable commodity. Their stability and seeming durability favored their general application, so they soon superseded the non-rubber plasters. While the latter have retained their place in the U. S. P. during the nearly three decades since the introduction of rubber plasters, they have become practically obsolete, and it is felt that unless they can be improved, so as to respond to the requirements of rubber plasters, they had better be dropped from the U. S. P.

### THERAPEUTIC GROUPING.

As has been observed on several former occasions, the vehicle for medicated plasters requires some other attribute than simply adhesiveness. From a study of the therapy of plasters, they may be put in three groups, similarly to the ointments with reference to their general therapeutic uses, which also governs the selection of the respective vehicles:

1. Epidermatic: Supportive, protective, antiseptic, counter-irritant, vesicant. Vehicle: Rubber or any suitable adhesive.

Official plasters: Emp. adhesivum, E. capsici.

2. Endermatic: Anodyne, astringent, alterative, resolvent, sedative, stimulant. Vehicle: Oleates or lead plaster, sometimes with resins or gum-resins.

Official plasters: Emp. Belladonnæ, E. opii, E. plumbi, E. saponis.

3. Diadermatic: For constitutional or systemic effects. Vehicle: Lanolin or plaster-mull.

Official plasters: Emp. hydrargyri.

### METHODS OF PREPARING RUBBER PLASTERS.

*Mechanic Roller Pressure Method.*

This method of incorporating the rubber with certain substances to give it the necessary body to serve as a vehicle is at present the only one employed. But since it requires the use of the heaviest machinery—some of the apparatus weighing many tons—and enormous steam-power, its application for pharmaceutical purposes is out of the question.

As is well known the process consists in:

1. Purification of the rubber by macerating and pressing it and removing foreign impurities by elutriating it with water.

2. Forming a homogeneous mass of the dried purified rubber by working it on heated revolving rollers and incorporating sufficient quantities of Orris powder and oleoresins.

3. Incorporating the medicinal agent, *i. e.*, belladonna extract, with the rubber mass by working it on warmed revolving rollers.

4. Spreading the prepared plaster.

### SOLUTION IN VOLATILE SOLVENTS.

This process has been recommended from time to time, the principal objection being the use of so relatively large quantities of inflammable solvents.

*The German Pharmacopœia Method.*

The following is the formula of "Arzneibuch für das Deutsche Reich," 1900:

Emplastrum adhæsivum—

| | | |
|---|---|---|
| Lead plaster, water-free | 40. | Gm. |
| Petrolatum | 2.5 | " |
| Liquid petrolatum | 2.5 | " |

are melted together, and to the mixture add:

| | | |
|---|---|---|
| Resin | 35. | Gm. |
| Dammar | 10. | " |

previously melted. To the warm mixture is added:

| | | |
|---|---|---|
| Caoutchouc | 10. | Gm. |
| Dissolved in benzin | 75. | " |

and the mixture stirred on the water-bath until all the benzin is lost by evaporation.

The Colemplastrum adhæsivum of the Austrian Society is still more complex, the formula containing the following:

| | |
|---|---|
| Resin oil, empyreumatic | 150 Gm. |
| Copaiba | 100 " |
| Resin | 100 " |
| Lard | 50 " |
| Wax | 30 " |
| Dissolved in ether | 1200 " |
| In which caoutchouc | 250 " |

has been previously dissolved; to this is then added:

| | |
|---|---|
| Orris powder | 220 Gm. |
| Sandarac | 50 " |
| Ether | 400 " |

The mixture, when uniform, is spread on cloth.

SOLUTION OF RUBBER IN FIXED SOLVENT: PETROLATUM AND INCORPORATION WITH LEAD ACETATE.

India rubber dissolves, though with difficulty, in petrolatum. The heat required to melt the rubber being comparatively high, usually considerably more than 100° C., as stated in the U. S. P., it is necessary to melt the rubber first and then add the petrolatum, in order to avoid subjecting the latter to the higher temperature. The mixture of equal parts of rubber and petrolatum is of a soft jelly consistence, not especially adhesive, but when incorporated with the lead oleate furnishes a very adhesive plaster. While at first 5 per cent. of each rubber and petrolatum was used, it has been found that the petrolatum would melt and exude around the edges of the plaster when applied to the skin, and the quantity was therefore reduced to 2 per cent. of each. This mass affords a plaster which is readily adhesive to the body, does not run nor become too soft. Plasters spread on cloth have been kept for months exposed to the sun in the summer weather without losing their stability or permanency.

The lead oleate made by the interaction of hot solution of soap and lead acetate, thoroughly washed with hot water, and freed from water by working the precipitated oleate on a hot tile, is much to be preferred to the lead plaster made by the present official process. The time-honored method of boiling litharge, olive oil and water is for the requirements of the pharmacists most tedious and unsatisfactory. Since in the beginning of the process, at least, a temperature higher than that of 100° C. is required, the water-bath cannot be employed, and in the absence of this limiting device the product is usually "scorched." When the steam-bath under pressure can be used, this objection does not apply. But the boiling process requires from 3 to 4 hours, with more or less attention while the precipitation method does not take over half an hour. Besides, true

litharge is difficult to obtain, and any other kind will produce unsatisfactory results.

The following is the process employed:

| | |
|---|---|
| Lead oleate (Emplastrum plumbi)— | |
| Soap, granular and dried | 100 Gm. |
| Lead acetate | 60 Gm. |
| Distilled water, a sufficient quantity. | |

Dissolve the soap in 350 Cc. hot distilled water and strain the solution. Dissolve the lead acetate in 250 Cc. hot distilled water and filter the solution while hot into the warm soap solution, stirring constantly. When the precipitate which has formed has separated, decant the liquid and wash the precipitate thoroughly with hot water. Remove the ppt., let it drain, free from water completely by kneading it on a warm slab, form it into rolls, wrap in paraffin paper and preserve in tightly closed containers.

| | |
|---|---|
| Emplastrum adhæsivum— | |
| Rubber, cut in small pieces | 20 Gm. |
| Petrolatum | 20 Gm. |
| Lead plaster | 960 Gm. |

Melt the rubber at a temperature not exceeding 150° C., add the petrolatum, and continue the heat until the rubber is dissolved. Add the lead plaster to the hot mixture, continue the heat until it becomes liquid; then let it cool and stir until it stiffens.

### PLASTER VEHICLES.

Adhesive plaster is official in fourteen pharmacopœias, in one only, the German Pharmacopœia, has any attempt been made to employ rubber in the formula, except that a similar formula has been proposed for the Austrian Pharmacopœia.

These formulas have met with much criticism, which they undoubtedly deserve.*

* The desirability of a formula which will produce a plaster having the adhesive and stable qualities of commercial rubber plasters is generally recognized. To admit rubber plasters into the U. S. P., without giving a formula by which they can be made by the retail pharmacist would be a decided innovation; something which has not been done in any other classs of galenic or pharmaceutic preparations. Beside the vehicle for plasters intended for endermatic and diadermatie uses is of as much importance as is the medicinal agent. The rubber vehicle serves admirably for adhesive or purely epidermatic purposes, but its use for the plasters of the more important groups is, certainly, to say the least, of questionable propriety. This is evident from the fact that the two most important pharmacopœias of recent issue: The British of 1898, and the German of 1900, have not made any attempt in that direction.

To recognize or describe medicated plasters, such as belladonna and opium, by defining the alkaloidal strength without reference to the particular vehicle employed would be a therapeutic negation. Their value depends not alone upon the amount of medicinally active agents they represent, but upon the character of the vehicle and its appropriateness for the purpose in view.

### THE SPREADING OF PLASTERS.

The spreading of plasters by the pharmacist has been well called a lost art, and the reason therefore is not far to seek. The plaster mass was difficult to handle, the spreading required too much time and was a very disagreeable operation, and the finished product, the spread plaster, was unsatisfactory.

In the proposed formula the preparation of the plaster vehicle is easily and quickly effected, the mass is almost as readily manipulated as in an ointment or cerate, and the spread plaster seems to leave nothing to desire in physical properties, while its therapeutic properties may be easily predicated. The formula affords the pharmacist opportunities to prepare and spread rubber-plasters, since the vehicle contains rubber. Its adoption will suggest many unofficial uses for such as the extensively employed salicylic acid plaster, and may cause the lost art of plaster spreading to be again witnessed in the pharmacies instead of being viewed, as during the last decade, as a curiosity in the spreading of asphalt in the construction of roadways for streets.

*Chicago College of Pharmacy, Aug. 1, 1903.*

The Chair said the paper would take the usual course without objection, and called for the next paper on "The Benzin of the Pharmacopœia," by Mr. E. H. Gane. The author presented the following paper in abstract:

## THE BENZIN OF THE PHARMACOPŒIA.

BY E. H. GANE, PH. C.

Complaints have been made by chemists that it is difficult, if not impossible, to obtain petroleum ether of a fairly constant boiling point, and an investigation of numerous samples from various sources has shown that not only is the complaint justified, but that it is impossible to procure a product that will distill between any narrow limits of temperature. The reason for this is easy to see when the nature of the product is considered.

The liquid now sold as petroleum ether is generally the fraction of the light petroleum distillate taken from the stills at 60 to 65 or 70° C. Some makers supply a product labeled as boiling at from 50 to 60° C., according to the U. S. P. requirements. The specific gravity of a number of samples which have come under observation has ranged from 0.648 to 0.687.

The hydrocarbons found in American petroleum readily undergo, upon heating, the change known technically as "cracking," that is to say, they are changed either by dissociation or polymerization into bodies of different boiling point. So marked a feature is this of American petroleum that the "cracking" of heavy hydrocarbon oils for the production of lighter fluids is a well known detail in the manufacture of petroleum products. Just what causes the change is not well understood, but it can be readily observed to take place when portions of condensed liquid drop back upon the hot fluid in the retorts.

The U. S. P. describes petroleum ether or benzin as a colorless diffusible liquid, boiling at from 50 to 60° C., and with a specific gravity of from 0.670 to 0.675. The commercial product is variously described as petroleum ether, petroleum spirit, benzin, naphtha, gasoline, ligroin or rhigolene. Originally these terms were applied to fractions of crude petroleum boiling at different temperatures. Thorpe's Dictionary of Applied Chemistry gives the following classification: Rhigolene boiling from 18 to 20° C., petroleum ether 70 to 90° C., gasoline 70 to 90° C., naphtha 80 to 110° C., ligroin 80 to 120° C. and benzin 120 to 160° C., but these distinctions have gradually been set aside and to-day each manufacturer adopts his own terminology. It may be noted in passing that a lighter distillate is sometimes supplied upon orders for rhigolene.

An examination of a large number of samples of the petroleum ether of the market gave practically concordant results, dissociation or polymerization upon heating being invariably noted. As all the samples examined gave nearly identical results, and the phenomena are the same in each case, it is unnecessary to do more than illustrate the behavior of petroleum ether on distillation by a typical sample. The sample was taken from a lot obtained from a leading chemical house and was labelled "Petroleum Ether, B. P. 60 to 65° C." Its specific gravity taken with a Westphal balance was .671.

One hundred cubic centimeters of this sample was placed in an ordinary side-neck flask and distilled rapidly on a sand bath. The liquid commenced to distill at 35° C. and the following table shows the result of the distillation:

| | | |
|---|---|---|
| Boiling at 35 to 40° C. | 20 Cc. | 20 per cent. |
| " " 40 to 50° C. | 35 Cc. | 35 " |
| " " 50 to 60° C. | 20 Cc. | 20 " |
| " " 60 to 70° C. | 10 Cc. | 10 " |
| " " 70 to 80° C. | 5 Cc. | 5 " |

The residue distilled all the way up to 110° C. A further portion of 500 Cc. was then distilled in the same manner, but the distillation was carried on more slowly by means of a water bath. The result follows:

| | | | |
|---|---|---|---|
| Boiling at 30 to 50° C. | 60 Cc. | S. G. .646 | 12 per cent. |
| " " 50 to 60° C. | 105 Cc. | " .6554 | 21 " |
| " " 60 to 70° C. | 185 Cc. | " .6685 | 37 " |
| " " 70 to 80° C. | 90 Cc. | " .6843 | 14 " |

Distillation was continued on a sand bath and yielded results as follows:

| | | | |
|---|---|---|---|
| Boiling at 80 to 90° C. | 10 Cc. | S. G. .7019 | 2 per cent. |
| " " 90 to 100° C. | 10 Cc. | " .7122 | 2 " |

The small residue left in the flask was not recovered.

A third portion of 800 Cc. was then distilled on a sand bath using a

Glynsky fractionating tube in order to obtain more perfect separation and to note the results obtained by slow distillation. The experiment furnishes an interesting comparison of the behavior of petroleum ether under varying conditions. The results are appended:

| | | |
|---|---|---|
| Boiling at 30 to 40° C. | 22 Cc. | 2.75 per cent. |
| " " 40 to 50° C. | 32 Cc. | 4.00 " |
| " " 50 to 60° C. | 140 Cc. | 17.5 " |
| " " 60 to 70° C. | 75 Cc. | 9.37 " |
| " " 70 to 80° C. | 50 Cc. | 6.25 " |
| " " 80 to 90° C. | 25 Cc. | 3.12 " |

At this point the distillation became very irregular and the residual fluid in the flask, while gently boiling, was not carried through the fractionating tube except at intervals when the condensed liquid dropped back into the flask.

The thermometer dropped to various points ranging from 50 to 80° C., and small portions of a very light distillate would come over. By varying the rate of ebullition it was possible to obtain fractions distilling at almost any temperature. The distillation was therefore not carried further.

Finally 100 Cc. of the fraction, from the last portion of 800 Cc., boiling at 50 to 60° C. was taken and again rapidly distilled on a sand bath. It distilled thus:

| | | |
|---|---|---|
| Boiling at 30 to 40° C. | 15 Cc. | 15 per cent. |
| " " 40 to 50° C. | 30 Cc. | 30 " |
| " " 50 to 60° C. | 15 Cc. | 15 " |
| " " 60 to 70° C. | 10 Cc. | 10 " |
| " " 70 to 80° C. | 5 Cc. | 5 " |

The distillation was then stopped.

Consideration of the above results shows that "cracking" occurs with the lighter petroleum hydrocarbons almost as readily as in the case of the heavier oils, and explains the difficulty of procuring petroleum ether boiling within narrow limits. Correspondence with the manufacturers of this product showed that they were aware of the difficulty, and brought only the statement that "if you are not satisfied with the product furnished, we would rather be excused from supplying it."

The Chair stated that the paper would take the usual course without objection.

MR. PUCKNER: The Standard Oil Company is now putting on the market an improved product, pentane and hexane, which you will soon be able to buy at a price below that heretofore put upon like products.

MR. BERINGER: The commercial benzins do not answer to the description and requirements of the Pharmacopœia, and as the official product is not obtainable, I think the Pharmacopœia should recognize both the commercial benzin, a grade obtainable in the market, and also a purified benzin, giving a process for such purification. The im-

purities in the commercial article consist largely of odorous principles due to sulphuretted constituents, and a purified product suitable for pharmaceutical purposes could be readily obtained by the use of potassium permanganate. The process as published in the American Journal of Pharmacy consists in agitating the benzin with a solution of potassium permanganate and sulphuric acid, decanting and again treating with a solution of potassium permanganate and sodium hydroxide. The benzin is separated and washed with water. Thus purified, benzin possesses no disagreeable odor, and is suitable for removing oils, fats and resinous substances from drugs. For the purposes of the analyst, the still more highly purified *petroleum ether* could be prepared by fractional distillation from lard or other fatty substances, as recommended by Dragendorff.

MR. HALLBERG: I should like to ask Mr. Gane if the article sold as gasoline does not more uniformly conform to the requirement for benzin than that which is sold as benzin?

MR. GANE: If the gentleman will refer to the paper, he will find that benzin, gasoline and various other names are applied indifferently by the manufacturers to the same product.

Mr. Kremers then presented the following paper in abstract at request of the Chair:

## ETHEREAL OIL.

BY I. W. BRANDEL.

It is a general rule among revisers of pharmacopœias to supply a detailed method of preparation for such articles of which our chemical knowledge is insufficient to provide physical constants and chemical tests for its control. The presumption is that the pharmacist himself will make that which he cannot control by analytic methods. This evidently holds true for ethereal oil and the heavy oil of wine necessary to its preparation.

The writer does not fear contradiction when he asserts that not one per cent. of the pharmacists of the United States prepare their own heavy oil of wine. If they use it at all in the preparation of Hoffman's Anodyne, they purchase it. It should be of some interest, therefore, to know how the commercial product or products compare with the pharmacopœial article.

In reply to a circular letter issued by Dr. Kremers in request for information relative to the revision of the U. S. P., a number of answers were received, from which the following statements may be gleaned.

To the query whether the manufacturer made his own ethereal oil only two affirmative answers were received. Of the two manufacturers, one makes it according to his "own private formula"; the other, in strict accordance with the U. S. P. of 1890. As a matter of fact, the U. S. P. formula is the one supplied by the second manufacturer.

The other manufacturers purchase the article, mostly without control of any kind. Only one jobber submitted results obtained by the examination of commercial products. Some think the English product superior; others use the German "Wein-Oel," or cognac oil; one firm frankly states that the price of the U. S. P. article, as made by its sole manufacturer, is "prohibitive."

In answer to the query, "What do you know about the method of preparation of the article which you purchase?" a candid "nothing" or "practically nothing" is recorded in several instances. Some state that they "understand the commercial article is obtained as a by-product in the manufacture of ether." As to the "private formula" mentioned above, no information was volunteered.

With such a state of affairs, methods of control would seem exceedingly important. In reply to the query, "By what standard do you control the commercial article?" an answer of refreshing frankness is generally received. As a rule no control is attempted. One of the informants states: "The description given in the Pharmacopœia is so meagre that the commercial products in common use, although not at all like the pharmacopœial product, are not condemned by any definite characteristics.

"We have no suggestions to offer with regard to the official formula, but we look for a fuller description of the product in the revised Pharmacopœia."

This brings us back to the pharmacopœial formula and description of the U. S. P. product. A decade ago, Dr. F. B. Power, who had in charge the revision of this article, recommended that it be dropped from the U. S. P.* His opinion was evidently not concurred in. Neither did the present Revision Committee see fit to include this article in its list for "Expurgations." One of the manufacturers is positive in his belief that it should be dropped from the U. S. P.; another has his doubts about its retention; a third has already been quoted above; the others are noncommital.

As to the method of preparation, little need be said, for even the firm that devised the process has no changes to suggest. Dr. Power,† a decade ago, reported a yield of 0.597 per cent. In the same paragraph he quotes Dr. Squibb as having obtained an average of 0.884 per cent. when working on a larger scale; also Prof. Diehl as having obtained a considerably higher yield, viz., 1.4 to 1.9 per cent. It thus becomes apparent that at the very best the yield is exceedingly small. This readily explains the "prohibitive" price of the U. S. P. article mentioned above. Instructors in practical pharmacy well know that inexperienced students frequently obtain a smaller yield than 0.5 per cent., and sometimes no heavy oil of wine at all.

If ethereal oil is to remain officinal, the present method of preparation might as well be retained. In order to test the method, several batches of heavy oil of wine were prepared, using Pharmacopœial quantities. The results are herewith tabulated:

* Pharm. Rundsch., 9, p. 268; also circular 109, U. S. P. Revision Committee, 1880–1890.

† l. c., p. 267.

| No. | Yield. | Sp. Gr. | Diethyl Sulphate. |
|---|---|---|---|
| 1..... | 18.3 Gm. = 0.7 per cent. | 1.15402 | 47.03 per cent. |
| 2..... | 9.5 Gm. = 0.36 per cent. | 1.16638 | 45.4 per cent. |
| 3..... | 10.7 Gm. = 0.4 per cent. | 1.1569 | 44.0 per cent. |
| 4..... | 8.0 Gm. = 0.3 per cent. | 1.04004 | 28.2 per cent. |

By way of explanation, it should be stated that the mixture of alcohol and sulphuric acid of No. 1 was allowed to stand forty-eight hours instead of twenty-four hours. Further, that after the temperature of the mixture had been raised nearly to the boiling point, an accident to the condenser necessitated an interruption of an hour, and subsequent heating of the mixture. Which of these two digressions is responsible for the increased yield it is impossible to state. However, mention should be made here of the fact that product No. 4 was obtained from the residues of Nos. 1 and 2, by heating the joint residues a second time, after several days' standing.

That the product in this case is different from that obtaincd in strict accordance with the U. S. P. method becomes apparent from the lower specific gravity and lower ester content of No. 4. As to odor, that of No. 4 was more agreeable than that of the other products, neither did it disappear after saponification. Finally, it should be stated that products 1, 2 and 3 were prepared by different operators.

These results do not admit of any definite conclusions. However, they may suggest a query. If the diethyl sulphate, which presumably is quantitatively the most important constituent of the heavy oil of wine, is responsible for the therapeutic effect desired, it certainly can be prepared more economically than according to this method. If the non-ester constituents are the desired ones, product No. 4 would indicate that the Pharmacopœial method can possibly be improved upon. With so much darkness surrounding the chemistry as well as the therapeutics of the preparation, even a shrewd guess affords little or no satisfaction. It is to be hoped that some one will, one of these days, make a thorough study of the chemical constituents of the Pharmacopœial product, and will supply a pharmacologist with the pure chemical components for a physiological study.

Concerning the description of the product, Dr. E. H. Squibb suggests the introduction of "a statement to the effect that the oil grows darker with age (perceptibly in six months) and becomes acid to litmus paper."

The urgent demand for a more characteristic description has already been quoted above.

The fact that diethyl sulphate is apparently the principal constituent quantitatively of the heavy oil of wine, suggests the assay of the product by saponification. Although the ester may have little or nothing to do with the therapeutic effect of the heavy oil of wine, it appears to be thus far the only known constituent, hence no other rational chemical test is available at present.

An accurately weighed quantity of heavy oil of wine was saponified with an excess (15 Cc.) of approximately 5 per cent. alcoholic potassa, previously standardized, and the amount of consumed KOH determined by titration with normal sulphuric acid. The ester content was calculated as diethyl sulphate.

1. 2.19425 g. require 13.4 Cc. N/1 KOH for saponification, corresponding to 47.03 per cent. of diethyl sulphate.
2. 1.1586 g. require 6.8 Cc. N/1 KOH for saponification, corresponding to 45.4 per cent. of diethyl sulphate.
3. 1.4491 g. require 8.6 Cc. N/1 KOH for saponification, corresponding to 44.2 per cent. of diethyl sulphate.
4. 1.3937 g. require 5.1 Cc. N/1 KOH for saponification, corresponding to 28.2 per cent. of diethyl sulphate.

The reason for the low percentage in No. 4 has already been given.

That the method will give concordant results becomes apparent from the following data obtained by duplicate assays of the same product:

a) 2.431 g. require 14.7 Cc. N/1 KOH for saponification, corresponding to 46.9 per cent. of diethyl sulphate.
b) 3.1268 g. require 19.2 Cc. N/1 KOH for saponification, corresponding to 47.2 per cent. of diethyl sulphate.

Even the ethereal oil, with its volatile ether content, will give fairly concordant results as shown by the following data:

a) 4.62 g. require 16.9 Cc. N/1 KOH for saponification, corresponding to 28.2 per cent. of diethyl sulphate.
b) 4.6591 g. require 17.3 Cc. N/1 KOH for saponification, corresponding to 28.4 per cent. of diethyl sulphate.

In addition to what has been said about the commercial product the following data supplied by a jobbing firm may here be quoted:

| Sample. | Sp. gr. | Boiling Temp.* | Reaction | Sulphates. |
|---|---|---|---|---|
| 1. | 0.928 | 240–245° | Neutral. | None. |
| 2. | ? | 244–245° | " | " |
| 3. | 0.897 | 190–208° | " | " |
| 4. | 0.904 | 215–225° | " | " |
| 5. | 1.177 | Charred, due to large amount of free $H_2SO_4$. | Acid. | Present. |
| 6. | 0.892 | 195–245° | Neutral. | None. |
| 7. | 0.901 | 205–265° | " | " |
| 8. | 0.904 | 205–280° | " | " |

* The boiling temperature of the oil of wine made by the writer was found to be 180–195°.

† "Oil of Wine" (true from grapes). Upon saponification 3.0505 Gms. of this oil required 0.7 Cc. N/1 KOH solution.

The following commercial samples, kindly supplied by several firms, were examined by the writer with the following result:

| Sample. | Sp. gr. | Boiling Temp. | Reaction. | Sulphates. |
|---|---|---|---|---|
| 9. | 1.1732 | — | Acid. | 50.4 per cent. |
| 10. | 0.9057 | Charred. | Acid. | 24.8 per cent. |
| 11.† | 0.8959 | 220–240° | Neutral. | None. |

It thus becomes apparent that the conditions prevailing as to heavy oil of wine, ethereal oil and Hoffmann's Anodyne are exceedingly unsatisfactory. Our ignorance concerning the chemistry of these products is dense. Whether the thereapeutics of these products is in a more satisfactory state, the writer does not know.

The only thing about which there can be any degree of certainty is that the average patient for whom Hoffmann's Anodyne is prescribed does not get the pharmacopœial article. Whether the variable articles of commerce are to any degree satisfactory substitutes therapeutically, the writer has no knowledge to affirm or deny. Chemically, however, and therefore pharmaceutically, this group of pharmacopœial products presents a state of anarchy that seems well nigh intolerable.

MR. HALLBERG: I have often wondered why the Pharmacopœia directs that heavy oil of wine should be diluted with 50 per cent. ether. Does that keep it, or is it because of the expense?

MR. CASPARI: The heavy oil of wine is diluted with ether to obtain official ethereal oil.

MR. HALLBERG: Would it keep just as well without the ether?

MR. CASPARI: No, I think not. Some years ago I undertook to solve a problem somewhat similar to this by correspondence with the different manufacturers of the country, and finally gave the matter up in disgust. I had the same experience that Mr. Kremers has related of himself. Some manufacturers told me that they made it according to their own formulas, and that was all I could get out of them.

MR. GOOD: I think as a matter of fact that they do not make ethereal oil; they simply use materials left in the retort after making the ether. They never separate the ethereal oil, and that is probably the reason why they do not want to tell you about the process.

MR. KREMERS: Most of them were willing to tell me where they got the product. It seems to me there should be some method of standardizing heavy oil of wine and such thing as that. On the market no two are alike; they all vary in density and specific gravity, and all other characteristics. In twenty years I have not seen two heavy oils of wine on the market having the same characteristics. I would like to have that explained. I would like to know also how different products of Hoffman's Anodyne can resemble each o her when the original oils are so unlike.

Mr. Mayo at this point moved to read the remaining papers by title, and Mr. Kennedy seconded the motion.

MR. SAYRE; I think this would be hardly justice to the writers of these papers. If we could limit the reading of these papers to five minutes we could get through with them; and, even without discussion, that would be a great deal better than to read them by title. I suggest that five minutes be allowed for the reading of each paper we have left, or for presenting an abstract.

THE CHAIRMAN: That is all right in theory, but I hardly think we can do that in the time allowed.

The motion of Mr. Mayo was then put and carried.

The Chairman then read the following list of papers by title, which, on motion of Mr. Whelpley, were ordered referred for publication:

The Structure of the Stem, Root and Leaf of Eschscholtzia Californica; By R. H. Denniston and H. J. Werner.

Mint; By W. A. Todd.

Personal Names and Synonyms in the U. S. P.; By M. I. Wilbert.

A Preliminary Report on the Assay of Sanguinaria; By W. H. Blous.

The Chemical Analysis of Methyl and Ethyl Alcohol Mixtures; By L. D. Haigh.

The Action of Oxidizing Agents, Particularly Potassium Permanganate and Iodic Acid, upon Morphine; By C. W. Johnson.

Resin of Podophyllum, U. S. P., or Podophyllin; By H. J. Lohmann.

Uses of Carbon Tetrachloride; By Otto Raubenheimer.

Contribution to the Chemistry of Chelidonine; By J. O. Schlotterbeck and H. C. Watkins.

Chemical and Physical Constants of Oil of Datura; By J. W. Baird and Flora E. Sleeper.

Rose Geranium Oil and its Substitutes, by Lyman F. Kebler.

Inferior Drugs and Insidious Methods of Deception; by Lyman F. Kebler.

Iron Peptonate; By L. A. Johnson.

Approximate Estimation of Sulphides; By R. H. French.

A Note Upon Some New Reactions for Antipyrine and Salophen; By Geo. M. Beringer.

On Glycerophosphoric Acid and Glycerophosphates; By F. Rabak and Edw. Kremers.

The Characterization and Classification of the Sesquiterpenes; by Oswald Schreiner.

# THE STRUCTURE OF THE STEM, ROOT AND LEAF OF ESCHSCHOLTZIA CALIFORNICA, CHAM.

R. H. DENNISTON AND H. J. WERNER.

*Eschscholtzia Californica* * is a shrub from 1 to 1½ ft. high, found in California southward through Mexico and South America, in dry, rocky soil. It rarely occurs growing wild east of the Rocky Mountains. In the early summer it blossoms in profusion and covers wide areas.

It was first collected by Chamisso, and described by him, in 1820, as follows: Sepals, coherent into a narrow pointed hood, deciduous from within a dilated top shaped torus. Petals, four. Stamens numerous with short filaments and linear anthers. Hoary, linear, with two nerve-like placentas: style very short; stigmas divided into four to six linear, unequal, divergent lobes. Capsules elongated, ten-nerved, one-celled, dehiscent the whole length by two valves, separating from the placental ribs; many-seeded.

Seeds, globose, reticulate or rough tuberculate. Smooth, glaucous, slender annuals with colorless bitter juice, finely dissected, alternate petioled leaves, and light bright orange or yellow flowers.

## ROOT.

The root examined was fleshy, unbranched, about 5 Cm. in length, 0.6 Cm. thick, surface smooth with a few short rootlets.

The appearance in cross section was whitish and compact, the woody centre being somewhat darker than the surrounding tissues.

The cork is made up of several rows of thin-walled, tangentially elongated, rectangular cells which measure from 25 to 60 $\mu$ in radial direction, and from 40 to 100 $\mu$ tangentially.

The cortical parenchyma consists of thin-walled irregular cells, closely packed together. They measure from 60 to 100 $\mu$ in both radial and tangential directions, and from 50 to 200 $\mu$ in longitudinal direction.

The phloem region is made up of a band of small, thin-walled cells, and lies between the central wood region and the cortical parenchyma. As seen in cross section, the larger cells in this region are the sieve-cells and the smaller ones with contents, the companion cells.

The parenchyma cells can not be distinguished from the sieve-cells in cross section.

The cambium consists of from one to two rows of small, thin-walled, irregular cells between the wood and the phloem, more easily seen in the older roots.

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* California Geol. Survey, vol. i, p. 22.

The medullary rays are from two to four cells in width and pass in almost straight lines through the wood and phloem regions.

The wood parenchyma cells are small, regular, slightly oblong, and together with the fibers make up the greater part of the wood tissue.

The vessels show different sorts of cell wall thickening and are of various sizes. The largest vessels have pitted or reticulated walls. They are round in cross section, and are of considerable length. The smaller vessels are mostly spirally thickened and pointed at the ends. They measure from 250 to 300 $\mu$ in length.

## STEM.

The stem examined was hexagonal in cross section and hollow, 0.7 Cm. in diameter, the inner tissue loose and pithy, with the bundles arranged in a circle.

Sections were cut from a stem 0.5 Cm. in diameter and about 5 Cm. from the root. A cross section of the stem shows an epidermis at the outside made up of a single row of cells, rectangular with rounded corners and elongated slightly in the tangential direction.

The outer and inner walls exceed in thickness the side walls. The cells measure from 30 to 40 $\mu$ in tangential direction and 25 $\mu$ in radial diameter. The epidermal tissue is perforated by numerous stomata.

The tissue immediately inside the epidermis consists of from one to several rows of thick-walled collenchyma cells.

Directly over the larger bundles, and at the corners of the stem, the collenchyma is well developed. The cells are round or elliptical in cross section and have thickened corners. They are elongated slightly in the tangential direction and measure from 25 to 35 $\mu$ in this view. Inside this collenchyma layer, there is a region of thin-walled, chlorophyll-bearing cells which is not present over the large bundles.

The individual cells making up this region are small, thin-walled, and at the widest part not more than three rows of these cells occur.

Between the bundles there is a thick-walled, pitted tissue.

In the stem examined, twelve large bundles were present, and where far enough apart, a small bundle occurred between two large ones. The individual bundles are broadly elliptical in shape; the outer part is made up of a sclerenchyma sheath composed of thick-walled, pitted cells.

The phloem region appears in cross section to be made up of thin-walled cells of various sizes.

The inner portion of the bundle is made up of the wood region or xylem.

The large thick-walled cells are vessels, and the smaller, thin-walled cells, parenchyma.

The pith region occurs inside the bundle ring and is broken away at the centre in older stems, leaving a hollow stem. The individual pith-cells are large and rounded, the largest measuring 130 $\mu$ in cross section. Many triangular intercellular spaces are present between the cells, and the cells are connected by simple straight pits.

### LEAF.

The leaves are finely dissected, alternate and petioled. The petiole is from 7 to 10 Cm. in length, and as seen in cross section is triangular in outline. It presents a flat surface to the stem and opposite to it is a rounded obtuse angle. There are three bundles in the petiole, a large one in the centre, and two small ones at the corners. The large bundle is made up of phloem and xylem, about equally divided. It is surrounded by a loose mesophyll.

In the cross section of the leaf we find an epidermis made up of a single row of rounded cells slightly elongated tangentially, measuring from 35 to 45 $\mu$ in tangential direction, and from 25 to 40 $\mu$ in radial direction. The cells of the upper epidermis have the same general form as those of the lower, but are somewhat larger.

The stomata are equally distributed over both surfaces. In shape they are oval and measure about 22 by 25 $\mu$.

There is a palisade tissue present beneath the upper epidermis made up of two or three irregular rows of elongated cells filled with chlorophyll. Through the middle portions of the leaf the cells are elongated in a plane parallel with the leaf surface. These cells also contain chlorophyll, but in smaller amounts.

The cells next the lower epidermis form a loosely arranged palisade of one or two irregular rows of chlorophyll bearing cells.

There are from 5 to 9 bundles present of different sizes in the leaf. Each is surrounded by a number of large thin-walled cells, in which there is no chlorophyll.

## MINT—ITS EARLY HISTORY AND MODERN COMMERCIAL DEVELOPMENT.

BY A. M. TODD.

When nearly a century ago the pioneers of a new civilization were blazing the boundaries of our commonwealth, they were filled with admiration for our magnificent forests, beautiful lakes and streams, and fertile soil, and they fittingly chose as the official motto to be engraved on the seal of our state the words: "*Si quaeris peninsulam pulchram circumspice*" (If you seek a beautiful peninsula, look around you).

With a coast line approximating two thousand miles, the genial climatic influence of the great lakes was early recognized as giving to aromatic plants and fruits a rare delicacy of flavor, which gave birth to the famous "Michigan Fruit Belt" along our Western coast. It is accordingly quite natural that upon these rich and fertile plains, with such happy environments and gifts of nature, is found the home of the world's peppermint industry.

## EARLY HISTORY.

"Mint" was among the plants first recognized as of value by the ancients and by them given a specific name; and many interesting references to it are found in the earliest known literature. Its extreme antiquity is attested by the fact that it was known in Greek mythology, where it was given a birth both romantic and immortal in connection with the amors of the gods. "Mintha" (*Μίνθη*), a beautiful girl had won the affections of Hades (Pluto), and in a fit of jealousy was transformed by Ceres into the plant which was then given her name, from which followed the Latin "Mintha," "Mentha" and "Menta." Evidencing the widespread belief in this legend, there still exists under this same name in Pylos, the hill (*Mount Mintha*), upon which the transformation occurred: and at the base of the mountain was in ancient times a grove dedicated to Ceres and a temple to Hades. This romantic tradition is recorded by several classic writers, among whom are Strabo (Geographia, liber 8), Julius Pollux, and others.

Probably the earliest reference to mint preserved in the writings of the ancients is in the works of Hippocrates, the most celebrated physician of antiquity, born about B. C. 460, who among other things mentions it as an excitant to amor. A very interesting reference is found in the writings of Aristotle, born B. C. 384, mentions its well-known cooling and soothing effects as well as its antiseptic properties. Theophrastus, the successor of Aristotle, in his "ΤΟ ΙΣΤΟΡΙΑΣ ΦΥΤΩΝ"* (History of plants), also mentions mint, but under the newer name *Ἡδύοσμος*, (fragrant, or sweet-scented). We are told by Strabo and other Classic writers that this new name was given it since many of the Greeks desired the plant to have a name suggesting its fragrance; and the new name seems to have been adopted by most of the later Greek Classic writers as well as in the Greek Gospels of Matthew and Luke. Pliny, however, in his "Historia Naturalis" states that the Romans preferred to retain the more romantic and ancient name.

One of the most interesting references to Mint in ancient writings is the

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* *Theophrasti Eresii De Historia Plantarum. Græce et Latine. Amstopelami, Anno* 1664 (Folio).

recorded utterance of Jesus, where, in Matthew xxii. 22, he says, "Ye tithe the mint, anise and cummin." The same passage in Luke xi. 42, reads, "Ye tithe mint and rus and all manner of herbs." In both the original Greek Gospels the later name, "sweet-scented," is used. It is worthy of note that Mint is the only herb mentioned in both Gospels, and it would hence seem to be the most prominent of all known herbs; and the fact that the laws provided for taxes to be paid in it would indicate that it may have been regularly cultivated in Palestine at that time.

A most interesting account of Mint is given by Pliny, 23–79 A. D., in his "Historia Plantarum" (liber xix., cap. 8), also in liber xx., cap. 14. Among other things he mentions the means of propagation; and that on account of its pleasing odor it was used in banquets, and notes also its well-known medical virtues. Ovid ("Fasti"*) speaks of Mint as having magical power.

"OBSUTUM MENTA TORRET IN IGNE CAPUT."

Unfortunately neither time nor space permits more than a very brief reference to the writers following the Christian era. The great physicians Galenus (liber vi.) and Celsus (liber iv.), who both flourished in the first century; Dioscorides in the second century (liber iii., cap. 35–36) and the celebrated Arabian Avicenna (A. D. 980–1037), all were well acquainted with Mint and recorded the virtues for which it is to-day prized. In his celebrated book, "Liber di Arti Distillandi" (published in 1500, and which was followed with enlarged editions with very many rare plates illustrating the art of distillation and pharmacy), Braunschweig mentions five species of Mint, *M. crispa*, *M. aquatica*, *M. rubra*, *M. balsamica*, and *M. sarenica*, but it is difficult to recognize them all with precision.

The first printed allusion to Mint in the English language which I have yet found is in the famous "Breeches" Bible, printed in London in 1597 (which derives its name from the rendering of Genesis iii. 7): "They sewed figge-tree leaves together and made themselves breeches." In this edition the utterances of Jesus already referred to in the Greek, reads: "Ye thithe Mynt and Annyse and Cummyn." In the following year (1598) appeared the splendid folio edition of the works of Matthiolus,† which included the writings of Dioscorides, etc., with annotations. In this work seventeen species of Mint are noted, and nine important species engraved, viz.: 1. Mentha; 2. Mentha Altera; 3. Mentha Crispa; 5. Mentha Græca; 6. Calamintha; 7. Calamintha magno flore; 8. Calamintha Montana; 9. Calamintha aquatica.

"Gerrarde's Herball"‡ (London, 1633), gives a very interesting de-

* *Galena Librorum.* (Aldus, Venice, 1503, 5 vols., folio. 1st edition.)

† *Matthioli Medica Cæserei Opera quæ extant omnia*, MDXCVIII. (Basle. Folio.)

‡ *The Herball, or Generall Histoire of Plantes.* Gathered by John Gerrarde, of

scription of the various varieties known to the writer (pages 679–686), with engravings of nineteen species, including the "calamints." These are as follows: *Mentha sativa rubra* (Red Garden Mints); *Mentha cruciata, sive crispa* (Croffe Mint, or curled Mint); *Mentha Romana* (Speare Mint); *Mentha cardiaca* (Heart Mint); *Mentha spicata altera* (Balsam Mint); *Mentha aquatica, sive Sisymbrium* (Water Mint); *Calamintha aquatica* (Water Calamint); *Mentastrum* (Horse Mint); *Mentastrum niveum anglicum* (Party-colored Horsemint); "*Mentastrum minus* (Small Horse Mint); *Mentastrum montanus I. Clusii* (Mountain Horse Mint); *Mentastrum tuberosaradice Clusii* (Turnip-rooted Horse Mint).

In Parkinson's "Theatrum Botanicum, or Theater of Plants,"* published in London in 1640, very interesting descriptions of Mints and their uses are given (pages 30–38), with engravings of ten varieties, named as follows: 1. *Mentha Romana angustifolia sive cardiaca* (Heart Mint, or Speare Mint); 2. *Mentha cruciata* (Croffe Mint); 3. *Mentha crispa* (Scispe, or Curled Mint); 4. *Mentastrum hortense sive mintha sylvestris* (the Manured Wild Mint); 5. *Mentastrum niveum anglicum* (White Mints, or Party Colored Mints); 6. *Mentastrum montanum sive pannonicum* (Hungarian Wild Mints). The following species are given under the heading of "Calamintha:" 7. *Calamintha vulgaris* (Common Calamint); 8. *Calamintha montana præstantior* (the Greatest Calamint, or Mountain Mint); 9. *Calamintha arvenis verticillata sive aquatica bel* (Field Calamint, with whorled coronets); 10. *Calamintha minor incana* (Small Calamint).

The first reference to any of the Mints under a name suggestive of "Peppermint," appears to be in the "Synopsis Stirpium Brittanicarum" (2d ed.), by Ray, in 1696, his attention having been called to the plant by Dr. Eales, who had noticed it in Hertfordshire. In this work Ray describes it as "*Mentha spicis brevioribus et habitoribus, foliis, Mentha fuscæ sapore fervido piperis;*" and in his "*Historia Plantarum*" (1704, Tom III, 284), he refers to it as "*Mentha Palustris*," "Peper-Mint." Afterwards Linnaeus gave it the name "*Mentha Piperita*," by which it is now universally known. It is stated that Ray's original specimen, which is still in the British Museum, agrees practically with that under cultivation.

Peppermint also appears to have been grown on the continent at Utrecht as early as 1771, having been mentioned by the botanist Gaubius† that year. It also was known in Germany, and renewed interest was awakened in it through the writings of Knigge.‡ It became first official

London, Master in Chirvrgerie. Very much enlarged and amended by Thomas Johnson, citizen and apothecary, London, 1633 (folio).

* *Theatrum Botanicum: The Theater of Plants, or an Herball of Large Extent.* By John Parkinson, Apothecary of London, and the King's Herbalist, London, 1640 (folio).

† *Adversariorum varii argumenti liber unus*, Leidæ, M. D., CCLXXI.

† *De Mentha Piperitide*, Commentatio, Erlange, MDCCLXXX.

in the London Pharmacopœia in 1721, as "*Mentha piperitis sapore.*"

It is well known that the "Mints" have the power of modifying their botanic structure, and the flavor of their essential oil by changes in soil, climate, the class of fertilizers used, and methods of cultivation. In this connection I might mention the fact that the Mitcham peppermint plants which I imported from England about twenty years ago, have already commenced to show modifications in structure, and the flavor of the oil has in the meantime undergone a change approximating more closely that of the original American variety. When visiting the Yosemite Valley, California, famous for its magnificent scenery, a few years ago, I found a species of mint growing there indigenous, resembling *Mentha Canadensis*. No peppermint had ever been cultivated within a thousand miles of this valley, and it is interesting to speculate as to whether this may have been one of the earliest forms of the Mentha genus. The flavor of this plant resembled that of pennyroyal (*Mentha Pulegium*) rather more than peppermint.

The cultivation of "Mint" appears to have been conducted in Japan centuries before the industry had assumed a commercial status in Europe; and though no authentic records to that effect are to be found, it is said to have been known in that country for over two thousand years. The methods of distillation are extremely crude, and the variety of plant differs both in botanic structure and in the flavor of its oil from the true peppermint plant. The Japanese plant is *M. Arvensis*, and appears such as might be expected from a hybridization of *Mentha Viridis* (Spearmint) and *Mentha Canadensis*. The oil is very inferior in quality to that of *M. Piperita*.

## COMMERCIAL HISTORY.

The commercial industry began at Mitcham, in Surrey, England, about the year 1750, where at that time only a few acres of ground were devoted to medicinal plants. Fifty years later the area under cultivation was about one hundred acres; but the growers having as yet erected no distilleries, the plants were still carried to London for distillation. The industry in England reached its maximum just a century after its inception, the area under cultivation being about five hundred acres, after which it began rapidly to decline owing to American competition, being reduced during the next fifteen years to about two hundred and fifty acres. When visiting the English peppermint fields, I found the plants less robust and productive than in America, which is in part due to our more fertile soil and improved appliances for cultivation and distillation.

The inception of the industry in America may be said to have been started in 1816 by Mr. Burnet, who collected a quantity of plants on the shore of a stream in Wayne county, state of New York, and distilled therefrom about forty pounds of oil. From this small beginning the industry developed, until Wayne county, New York, soon became the chief pepper-

mint-producing section of the world, and was for many years famous for the quality of its production. In the year 1835 the first peppermint was planted in Michigan in St. Joseph county on White Pigeon prairie, the first distillery being erected the following year. The distilleries first built in Michigan resembled those of Wayne county, which in turn resembled those of England; the essential features being a copper "still" into which the plants were placed immersed in water, under which a fire was directly built, the escaping steam being condensed in a crudely constructed "worm" or condenser. Many years ago the production of peppermint oil in Wayne county, New York, was in some years as great as 50,000 pounds, but owing to the more favorable soil found in Michigan and our improvements in distilleries and methods, the production has been reduced to about 8,000 pounds. Peppermint was also cultivated for some years in Ohio and some more southern states, but in all these states it has been for some years abandoned.

In the year 1846 a radical improvement in the form of distillery was effected in Michigan by substituting for the "copper kettle still" large wooden vats with steam-tight covers operating upon hinges, allowing them to be opened and closed at pleasure. A short distance above the solid bottom of the vat was placed a perforated removable bottom, upon which the dried plants were closely packed, after which the cover was closed down, distillation being effected by the ingress of steam under the perforated bottom by means of a pipe with valves connected with a steam-generating boiler placed some distance away. Two of these vats were placed in each distillery. With this improvement it was possible to keep continuous fires in the furnace, also to allow distillation to progress constantly and uniformly, since the ingress of steam is regulated by valves and pressure guages. Under the new system the yield of a single distillery increased from fifteen pounds to about fifty or seventy pounds of oil per day, also producing a higher quality, since the danger of forming empyreumatic products by direct contact with the fire was overcome. The size of the vats has gradually increased, and in the four newest distilleries erected on our farms each distillery has four vats with a capacity of about four thousand pounds per vat for each charge. Proportionately large steam-generating boilers are necessarily required, and we have introduced "steam cranes" for handling the plants. The distilled charges are spread on the ground to dry, afterwards being removed to barns to be fed to horses and cattle. Improved tubular condensers, covered with non-corrosive metal, are used. When the weather is favorable, and the plants are well covered with leaves and blossoms, we have occasionally distilled over one thousand pounds of oil per day in a single distillery. We have three such distilleries at "Campania Farm."

SOIL.

Peppermint is now most successfully grown on land which centuries ago

formed the bed of ancient lakes in which various aquatic plants grew luxuriantly, whose gradual decay during many centuries formed a rich, black soil of decomposed vegetation. After the subsidence of the waters, trees of various kinds sprung up, so that the lake bed often became a forest. Additional soil was formed year by year by the falling leaves and decaying trees, until a thickness sometimes of over twenty feet of soil was created.

This soil is usually jet black and extremely rich and fertile. Lying relatively low, it is necessary to thoroughly drain it, which involves much expense. At "Campania Farm" it was necessary to construct over ten miles of canals and ditches, including the straightening and enlargement of a natural water course, which should serve as an outlet for the smaller drains. At "Mentha Farm" we are now constructing about fifteen miles of drains, including a canal four miles in length. This system will be so arranged as to be used for drainage when there is an excess of moisture, and for irrigation when more moisture is needed.

Owing to the soft and yielding nature of this soil, it is usually impossible for horses to work upon it during the spring months, or after excessive rains, except they are provided with "mud shoes," which consist of pieces of wood, about one inch in thickness, nine inches wide, and eleven inches long, fastened by clamps under the ordinary metal shoes. In the spring the water is scarcely one foot below the surface of the soil, and in the driest months it seldom recedes more than four feet below the surface. In America this soil is frequently known as "muck." It is rich in carbon, and can be converted into compressed fuel briquetts. This new use is now attracting wide interest in America.

### PLANTING AND CULTIVATION.

The ground, having been made ready by plowing the preceding year, is harrowed early in the spring to reduce it to a mellow state, being then marked with furrows about three feet apart. Workmen carry in sacks slung over their shoulders a quantity of the "root-stocks," which have been produced from the planting of the preceding year. These are about one-fourth inch in diameter and from one to three feet in length when in healthy state. They are placed lengthwise in the furrow by the workmen, who cover them with earth by a movement of their feet as they walk astride the row. An experienced workman can plant from one-half to one acre per day, according to condition of soil, roots, etc. With unfavorable conditions a smaller quantity is planted. With good weather the plants commence to appear above the ground within two weeks, but new plants continue to form for several weeks later.

Cultivating with horses begins within a few weeks after planting, for which purpose cultivators are used having many fine teeth. These are immediately followed by men with hoes, who remove the weeds and grass

which the cultivators have left. This process is continued until the plants have become so large as to render cultivation unnecessary, which usually occurs in July, at which time fresh root-stocks have commenced to be thrown out, which during August and September will entirely cover the ground. The crop thus grown for the first time is known as "new mint." In the meantime the fields which were planted the preceding year have thrown up a "second" crop, or "old" mint without replanting, and being earlier in the ground, mature sooner than does the "new." Harvesting begins when the plants have approached maturity, which is indicated by the appearance of long purple blossoms at the extremities of the stems, the leaves being well charged with oil, and those nearest the base of the parent stalk beginning to turn yellow and drop to the ground. It is at this season that the plants produce the highest quality of oil.

### HARVESTING AND DISTILLATION.

To prepare for distillation the plants are mowed and allowed to dry in the sun a little less than hay is usually dried, it being desirable that as much "curing" shall be done as may be effected without the loss of the leaves and blossoms in handling. Distillation is conducted with much greater rapidity and better quality of oil results when the plants are well dried, but if too dry a serious loss of oil occurs by abrasion. It was long supposed that a loss occurred by diffusion in the atmosphere through drying, on which account many growers drew the plants to the distillery in the green state, in which condition it requires fully twice the time for the extraction of the oil, besides much additional expense in handling the extra weight. The longer steaming also injures the quality by depositing resin in the oil extracted from the stems. It is found that the drying of the plants produces a physical condition of the leaves which causes the oil cells to be easily ruptured by the steam and distillation more quickly accomplished. It is of extreme importance that the entire crop should be distilled as quickly as possible after maturity.

To determine this question I made a careful experiment many years ago as follows: Equal areas of ground and equal quantities in weight of plants growing side by side were cut down at the same hour near mid-day, when the plants contained no abnormal moisture. Half the plants were immediately distilled. The other half were dried in the shade for six months, losing 49.4 per cent. in weight. It was found that no loss whatever of oil occurred by excessive drying, as the oil is held in microscopic cells which nature has thoroughly sealed.

The plants, having been properly dried, are drawn to the distillery, and are placed at once in the distilling vats already mentioned. If well dried, and a sufficient supply of steam is passed through them, distillation may be effected in from thirty to forty minutes; but in the case of undried plants, or those upon which cold rains have fallen, two hours are frequently

required. Steam is admitted at the bottom of the vats, the constant pressure forcing it upward through the plants. The heat expands and ruptures the oil-cells, and the oil, being thus carried away with the steam, passes through the condensers, flowing thence into a receiver, where separation occurs by gravity. Harvesting and distillation are effected in America during August and September.

In the very comprehensive and valuable work on "Volatile Oils," by Drs. E. Gildemeister and Fr. Hoffmann, may be found a number of illustrations representing scenes in peppermint harvesting, etc., as well as much interesting data regarding the industry.

The yield of essential oils varies greatly. With plants well supplied with leaves and blossoms, and under favorable conditions of weather, I have obtained nine to ten pounds of oil from one thousand pounds of plants; but with unfavorable conditions, less than one pound. The year 1902 having been exceedingly unfavorable, the yield of oil was the smallest for many years.

A fair estimate of the average annual production and consumption of American peppermint oil may be placed at two hundred thousand pounds per annum, although it is estimated by some at a higher figure. It is certain that the amount *sold* as "oil peppermint" is much greater than the quantity named, being increased by adulteration. Owing to the reduced crop of the past year, adulteration has existed recently to an alarming degree. Mr. E. J. Parry, B. Sc., F. I. C., in a report published in the "Chemist and Druggist," London, December 6, 1902, gives the tests of ten samples, all represented as pure, but none of which were pure; and the extreme adulteration in most of the samples is readily seen by their sp. gr. and optical rotation. Some are sold under spurious labels, with fictitious names of persons claimed as distillers, to hide the identity of the adulterators. I am glad to state that measures have been inaugurated for disseminating information regarding quality, tests, etc., which it is hoped will result in materially checking adulteration hereafter.

Peppermint in the pure state is highly agreeable and beneficial, and its consumption during the past twenty years has doubled, owing to the new uses which have been found, and an increased use for those purposes to which it had already been applied. It is estimated that about forty million pounds of peppermint plants are produced annually in Michigan, within a radius of seventy-five miles from Kalamazoo, yielding on the average about two hundred thousand pounds of essential oil. About one-half of this is consumed in America, the remainder being exported, chiefly to Europe.

## PERSONAL NAME SYNONYMS IN THE U. S. P.

### Some Biographical Data in Connection with the Personal Names that Appear as Synonyms to Galenical Preparations in the U. S. P.

M. I. WILBERT, PHILADELPHIA.

The names of persons, who are otherwise forgotten, are frequently preserved in connection with articles of every-day use. Such names frequently excite the curiosity of persons with an inquisitive turn of mind, who are willing to devote sufficient time to research to resurrect some information connected with the life histories of the persons thus partially immortalized.

In the United States Pharmacopœia there are a number of names of physicians and chemists that appear as synonyms to, or in connection with, some of the galenical preparations. The names, as such, are familiar enough, and no one would suppose for a moment that the life histories of the men themselves were not readily accessible. A careful search through one of the larger of recent biographical dictionaries revealed the fact that only four of these names were thought of sufficient importance to even merit the merest outline of the careers of the men they represent.

A systematic search for biographic data, including inquiries and correspondence for upward of a year, has elicited a number of interesting facts in connection with several of these names, that were thought of sufficient general importance to warrant their collection and preservation in the proceedings of this Association. Taking the names as they occur in the index of the United States Pharmacopœia, we first have Basham's Mixture.

*Basham's Mixture.*—This well-known ferruginous tonic, diuretic mixture, was originated by William Richard Basham, who was born in 1804 in Diss, Norfolk, England. Basham was first intended for a mercantile career, and began as a clerk in a banking business; later he studied chemistry with a view of taking charge of a brewery. He began the study of medicine in 1831 at Westminster Hospital, London. In 1833 he went to Edinburgh, where he obtained his degree. Basham returned to Westminster Hospital in 1834 as a clinical assistant, and remained connected with that institution in an official capacity until his death. He is said to have possessed considerable skill as a chemist, botanist, microscopist and artist. He was a liberal contributor to the medical literature of his time; was a member of the Royal College of Physicians in 1838 and a Fellow in 1850. Basham was elected Physician to Westminster Hospital in 1843, and died in London, October 16, 1877.

*Blaud's Pills.*—These bear the name of a Doctor P. B. Blaud, a French physician who was born at Nimes in 1774, and died at Beaucaire in 1858, thus reaching the very advanced age of 84. Blaud obtained his degree as physician in Paris in 1805, and despite what is said to have been a large and lucrative practice, contributed many valuable papers and monographs on a variety of medical as well as scientific subjects to the literature of his times.

*Donovan's Solution.*—This well-known solution of arsenic and mercuric iodide was originated by Michael Donovan, M. R. I. A., an Irish physician resident in Dublin, where he died in 1876 in his 85th year, having been born in 1791. He was for many years an honorary member of the Philadelphia College of Pharmacy, and his name appears quite frequently in the earlier numbers of the American Journal of Pharmacy in connection with articles of pharmaceutical interest.

*Dover's Powder.*—This gets its name from Thomas Dover, an English physician, who was born in Warwickshire in 1650, and died in London in 1741. Dover presents quite an interesting and varied life history. He was educated at Cambridge, where he obtained his degree in 1687. He practiced medicine in Bristol for some years. In 1708 with some friends he fitted out an expedition to the South Sea, and went himself as ship's surgeon. It is said that he had charge of the boat that landed on Juan Fernandez Island, February 2, 1709, and discovered Alexander Selkirk, the supposed original of Defoe's Robinson Crusoe. Selkirk had been marooned on the island by his own crew, and had remained there absolutely alone for four years and four months. He returned to England with Dr. Dover in 1711. After returning from this expedition, Dover resumed the practice of medicine in Bristol. He removed to London in 1721, where he published his "Ancients Physicians Legacy," which, among other interesting material, contains a formula for his diaphoretic powder. This formula is published in the chapter on gout, for which it was recommended as a sure cure. The original directions for this powder are as follows: Take of opium one ounce; saltpetre and vitriolated tartar of each four ounces; licorice root, one ounce, and ipecacuanha, one ounce. Place the saltpetre and vitriolated tartar in a red-hot mortar, and stir until they have been burned; then pulverize very fine; cut the opium, mix the other ingredients with this, and rub to a very fine powder. Dose, 40 to 60 or 70 grains in a glass of white wine whey at going to bed; while perspiring freely drink a quart or three pints of the white wine whey; in 2 or 3 hours at most the patient will be free of pain, even if he could not put his foot to the ground before treatment.

*Fowler's Solution.*—Thomas Fowler, the originator of this solution, and probably the first to introduce arsenic into the armamentarium of the physician, was born in York, England, January 22, 1736. He conducted a pharmacy for upward of 15 years, and then began the study of medicine in Edinburgh in 1774; he graduated four years later, writing his thesis on the treatment of pox by means of mercury. Fowler began the practice of medicine in Stafford, where he died July 22, 1801.

*Glauber's Salt.*—The popular name for hydrous sodium sulphate has in it a suggestion of the mediæval alchemist's dream of the philosopher's stone, and his futile search for a method of transmuting the baser metals into gold. Johann Rudolf Glauber was born at Karlstadt, Bavaria, in 1604.

He was one of the class of alchemists that began to see the greater possibilities in the practical use of the knowledge that had been gathered in the futile search for the philosopher's stone, and may be considered one of the first of the modern school of chemistry. He was quite a voluminous writer on chemical subjects. The hydrous sodium sulphate, discovered in 1658, was called by Glauber "sal mirabile," and was at first thought to be identical with the "sal enixum" (potassium sulphate) of Paracelsus. Glauber died at Amsterdam in 1668.

*Griffiths' Mixture.*—This is the anti-hectic or tonic mixture of Dr. Moses G. Griffiths, who was born in 1720. Griffiths studied at Leyden, where he obtained his degree of M. D. in 1744. He practiced for a number of years in London, from whence he removed to Colchester in 1768, where he wrote his "Practical Observations on the Cure of Hectic and Slow Fevers and the Pulmonary Consumption," which was published in 1776.

*Hoffmann's Anodyne.*—The compound spirit of ether was first prepared by Friederich Hoffmann in the early years of the 18th century. Hoffmann was born at Halle, February 19, 1660, and is usually considered one of the leaders of German medicine. Hoffman was the first professor of medicine at Halle, and was the author of "Systema Medicinæ Rationalis." His dictum that "experience and sense are the basis of medicine" is as true to-day as it was then. Hoffmann died at Halle, November 12, 1742.

*James' Powder.*—The pulvis febrifugus Jacobi dates back certainly to the middle of the 18th century, if not before. In 1754 the origin of this powder was claimed for a German by the name of Schwanberg, while a number of German books credit its origin to Hoffmann, one of the synonyms in use in Germany to-day being "Hoffmann's Spiessglanzkalk." Dr. Robert James, whose name is usually connected with this powder in England as well as in this country, was a native of Staffordshire, England, having been born in Kinverston in 1703. James studied medicine at St. John's College, Oxford, of which university he was a licentiate. He practiced in Sheffield, Litchfield and Birmingham, and finally settled down in London. Dr. James subsequently obtained the degree of M. D. from Cambridge in 1755. He died in London, March 23, 1776.

*Labarraque's Solution.*—So called from the celebrated French chemist Antoine Germain Labarraque, who was born at Oloran, May 29, 1777, and died near Paris, December 9, 1850. Labarraque's name is inseparably connected with the discovery and subsequent development of the hypochlorites of lime and soda.

*Lugol's Solution.*—The introduction of an aqueous solution of iodine in a solution of iodide of potassium is usually credited to J. G. A. Lugol, a French physician born at Montauban, August 10, 1786. Lugol studied at Paris, where he graduated in 1812. He was Physician to the Hospice St. Luis, to which he had been appointed in 1831. The various strength solu-

tions of iodine in solution of iodide of potassium were originally designated as Lugol's caustic, rubefacient and stimulant solutions. Lugol wrote a number of dissertations on scrofula, a subject that he was particularly interested in. He died in 1851.

*Monsel's Solution.*—Despite the fact that this is a comparatively recent addition to materia medica, and more or less well known throughout the whole civilized world, surprisingly little biographical data is available in the pharmaceutical journals. For the following information I am indebted to Mons. Alf. Riche, the editor of the "Journal de Pharmacie et de Chemie," Paris: Leon Monsel, "Pharmacien Major de 1e Classe," was born at St. Ciers Gironde in 1816, and died at Nancy in 1877. In 1852, while attached to the Medical Corps of the French army at Rome, Monsel discovered the hæmostatic properties of persulphate of iron.

*Tully's Powder.*—This perpetuates the name of a one-time professor at Yale College. Dr. William Tully was born in 1785. He was well known for the extent and varied character of his medical acquirements, and especially for his intimate acquaintance with the indigenous American materia medica. Dr. Tully commenced the publication of his "Materia Medica, or Pharmacology and Therapeutics," in 1852. This book, while it contains considerable original matter, is probably most interesting on account of its peculiarly complicated sentences. He refers to opium as "the crude, inspissated descending sap of papaver somniferum, commonly called opium." Dr. Tully died at Springfield, Mass., February 28, 1859.

*Plummer's Pills* were originated by Dr. Andrew Plummer, Professor of Chemistry in the University of Edinburgh. For some reason the name of Dr. Plummer has been neglected, and it is not even included in the recent and rather comprehensive edition of "British National Biography." For much of the following data I am indebted to Mr. I. T. Clark, Librarian, Advocates Library, Edinburgh: Dr. Plummer received the elements of his medical education at the University of Edinburgh, and then studied at Leyden, under Boerhave, where he obtained the degree of M. D. in 1722. Returning to Scotland he was admitted a member of the Royal College of Physicians, and commenced the practice of his profession in Edinburgh. In the preconcerted plan of introducing an elaborate course of medicel instruction at the University of Edinburgh, Dr. Plummer was to pay particular attention to the study of chemistry, with a view of teaching that branch on his return to Scotland. This plan was adhered to, and Dr. Plummer continued in that branch until 1755, being followed by the celebrated Dr. Cullen.

The introduction of a complete course of medical instruction at the University of Edinburgh is of particular interest to us in this country, there being a close connection between the introduction of medical instruction into this country and the University of Edinburgh, practically all of the early American teachers of medicine in America being graduates of that

school. As noted above, Dr. Plummer resigned the Chair of Chemistry in Edinburgh University in 1855. He died the following year, April 16, 1756.

*Vallet's Mass.*—The last of the personal names appearing in the index of the U. S. P. has been in many respects the most disappointing. A number of inquiries directed to well-known students and librarians have failed to furnish any positive biographic data. This is the more perplexing as Mons. A. G. Vallet, the originator of this particular form of ferruginous pill, appears to have been quite a liberal contributor to contemporaneous pharmaceutical literature. His name appears repeatedly in the pages of what was then the Journal de Pharmacie, now the Journal de Pharmacie et de Chemie, as a contributor. For five years, from 1836 to 1840, his name also appears on the title-page as one of the assistant editors. Vallet's article on a new ferruginous preparation was printed in 1838, having been brought to the attention of the French Royal Academy the year before by M. Soubeiran.

There are an additional number of galenical preparations that are frequently called for by a personal name synonym; these synonyms have, however, been dropped from the last, or earlier, editions of the Pharmacopœia. Some of them, like Huxham's Tincture, and Sydenham's laudanum, are named after well-known personages, but there are a few, like Lady Webster's Dinner Pill, that appear almost hopeless, particularly as the personal name, in this particular instance, appears to be a recent addition to a very old formula.

One correspondent, in answer to a letter of inquiry, alluded to research of this kind as "threshing over old straw;" while this is undoubtedly true to a very great extent, these names have been included in our vocabulary so long, and they are familiar to such a number and variety of individuals, that some knowledge of their origin would certainly not seem out of place.

## A PRELIMINARY REPORT ON THE ASSAY OF SANGUINARIA.

BY W. H. BLOME.

Quite a number of methods have been proposed for the estimation of sanguinaria, but of these many are not satisfactory. Various modifications of the so-called benzin method have found more or less favor with chemists. While working on sanguinaria, some time ago, we found that the supposed impurity insoluble in benzin behaved much like the alkaloids of this drug. Wishing to ascertain the accuracy of this method, we made many assays of a number of commercial samples of drug.

In the first place, we extracted a quantity of powdered sanguinaria with ether, so that 100 Cc. of ethereal liquid represented 5 Gm. of drug. A quantity of benzin was distilled and collected in ten fractions, the lowest boiling at about 45° C., and the highest over 120° C. Ten aliquot portions of this ether extract were assayed according to the benzin method, a different fraction of the benzin being used for each assay. While the amount

of residue varied somewhat, it was found, by repeated experiments, that the boiling point of the benzin used had but little effect upon the amount of this residue, as is shown by the following figures:

| Boiling point of benzin. | Weight of residue. |
|---|---|
| 43– 55° C. | 0.0200 |
| 60– 65° C. | 0.0160 |
| 110–120° C. | 0.0208 |

In a limited number of cases tried, we found considerable difference in the amount of residue when benzin and benzene ($C_6H_6$) were used on the same sample.

This benzin-insoluble residue was dissolved in a small amount of chloroform and this treated with standard acid. The chloroform was evaporated and the acid solution filtered. This was twice repeated, to insure the combination of the acid with the alkaloid. The filtrate was precipitated with Mayer's Solution and titrated with standard alkali according to Gordin's method. The amount of alkaloid thus found amounted to from one- to two-thirds or more of the actual weight of the residue.

Another series of assays was made, using as solvent various proportions of ether and chloroform. These were carried out according to the benzin method as before, but instead of determining the alkaloid in the benzin-insoluble portion only, we also determined that in the supposedly pure alkaloid. Two and one-half grams of drug yielded as follows:

| | Wt. benz. sol. "pure" alkaloid. | Alk. found in the "pure" alk. by Gordin. | Wt. benz. insol. but $CHCl_3$ sol. "impurity." | Alk. found in benz. insol. "impurity" by Gordin's method. |
|---|---|---|---|---|
| 1. | 4.98 per cent. | 3.06 per cent. | 2.06 per cent. | 0.79 per cent. |
| 2. | 4.68 " | 2.94 " | 2.26 " | 0.69 " |

From this it follows that not only does the supposed impurity from the benzin method contain alkaloid, but the supposed pure alkaloid is by no means pure. In all cases was this fact apparent when taking up the alkaloid with standard acid, when, even by repeated treatment of the residue with chloroform and this with acid, and the subsequent evaporation of the chloroform, a considerable portion remained as insoluble, somewhat oily residue.

Incidental to this work, we experimented with different solvents, and found the average weight of five samples by each solvent, reported as per cent. to be as follows:

1. Ether only, 6.72. 2. Ether 3 parts, chloroform 1; 7.75. 3. Ether 1, chloroform 3 parts; 7.62. 4. Chloroform only, 7.68.

Ether yields less extractive and for that reason is preferable for assay, more especially when aliquot portions are not taken.

The method which so far has yielded the best results in our hands is a modification of one suggested by Prof. Schlotterbeck, and is as follows:

Place 5 Gm. of powdered sanguinaria in a flask, add 50 Cc. of ether, shake for five minutes and add 5 Cc. of ammonia water. Place flask in a mechanical shaker and agitate for one hour. Transfer the mixture of ether and drug to a small percolator, wash the flask with ether and add to percolator. Continue this until 100 Cc. of percolate are obtained. Pour this into a beaker and evaporate to dryness over a steam bath. Add 1.5 Cc. of chloroform to dissolve the residue, and then 5 Cc. of $\frac{N}{10}$ sulphuric acid and 10 Cc. of water. Evaporate the chloroform, and when cool filter the acid solution through paper into a 100 Cc. measuring flask. Repeat, using 3 and 2 Cc. of $\frac{N}{10}$ acid. Wash the beaker and filter with water. Precipitate the alkaloid with Mayer's Solution, and make up to 100 Cc. with water. Filter through paper, collect 50 Cc., decolorize, if necessary with thiosulphate solution, and titrate excess of acid with $\frac{N}{50}$ potassium hydrate solution, using phenolphtalein as indicator. Multiply the number of Cc. of acid combined with the alkaloid by 0.035 and 40 to obtain the per cent. of alkaloid in the drug.

In the following table are appended a few results by the two methods. The first column contains the results, in per cent., by Gordin's titration; the second, the "pure" alkaloid by the Benzin method; and the third, the alkaloid found in the benzin residue and in the "impurity" by Gordin's titration.

| 1. | 2. | 3. |
|---|---|---|
| 4.24 | 4.98 | 3.86 |
| 3.61 | 4.68 | 3.62 |
| 3.62 | 6.66 | 3.60 |

I wish hereby to express my kindest appreciation for suggestions and advice given me by Profs. A. B. Stevens and J. O. Schlotterbeck.

*Pharmaceutical Laboratory, University of Michigan, June, 1903.*

## THE CHEMICAL ANALYSIS OF METHYL AND ETHYL ALCOHOL MIXTURES.

BY L. D. HAIGH.

Reported by A. B. Prescott.

Alcohol, "spirit of wine," as the essential principle of fermented beverages has been in use from ancient times to the present. On account of the evils attending its excessive use, it has been subjected in recent times to severe taxation as an attempt to regulate its production and consumption.

By an Act of the British Parliament in 1855 an inland revenue was to be collected on all spirits, calculated upon their equivalent in proof spirit. This so-called standard of proof spirit was a diluted alcohol which consisted approximately of equal volumes of absolute alcohol and water. The test usually applied by officials was to pour the alcohol to be tested upon gunpowder and apply a match. If the gunpowder was ignited the spirit

was "above proof," but if the quantity of water present was sufficient to prevent the ignition of the gunpowder, the spirit was said to be "under proof." As now defined by the British Parliament in a later Act, proof spirit has a specific gravity of 0.919 at 15.5° C., and contains 49.2 per cent. absolute alcohol by weight. Other spirits by their specific gravity are rated according to the volume of proof spirit to which they are equivalent. In the United States the percentage of alcohol is given by volume according to Tralles' tables.

The taxing of alcohol was a serious obstacle to its use for other commercial purposes, such as varnish making and other chemical manufacturing. On this account the mixture called methylated spirit was proposed as a substitute. In the Act of Parliament first referred to, provision was made to allow an alcohol called methylated spirit which contained 10 per cent. of wood alcohol to pass duty free, in order that manufacturers should not be embarrassed by a heavy tax. Wood alcohol as then used was the crude wood distillate containing all the other products, such as acetone and other ketones, methyl acetate, allyl alcohol, etc., which are formed along with the methyl alcohol in the wood distillation. The presence of this crude wood spirit in alcohol gave it a strong disagreeable odor which prevented its use as a beverage, but was not necessarily a bar to its use in manufacturing operations. The use of this methylated spirit as a substitute for alcohol in the preparation of drugs was forbidden.

In France the plan of denaturating alcohol gives a spirit which passes duty free. This is made by adding to the alcohol wood spirit or some pyridine bases which will prevent its use in the preparation of wines.

As long as the wood alcohol of commerce consisted of methyl alcohol only partially purified from the accompanying substances formed with it from wood distillation, there was little danger that it would be used to replace the ordinary alcohol in its principal uses. The peculiar, rank odor of crude wood spirit distinguishes it at once from the mild and more agreeable odor of spirit of wine. Within the last ten years methods have been perfected for obtaining the methyl alcohol practically pure. The Columbian Spirit of commerce is such an article. It has a pleasant odor somewhat approaching that of ordinary alcohol, and the manufacturers are endeavoring to extend its use for many of the purposes for which ethyl alcohol is required. There could be no particular objection to this fact as long as the Columbian Spirit replaced alcohol in the making of varnishes and like purposes. However, we find that during the present year * the chemist of the New York Board of Health has examined some of the tinctures common to the drug trade and has found that certain druggists had surreptitiously substituted methyl alcohol for ordinary alcohol in tincture of ginger and in spirit of camphor, either wholly or in part on account of its cheapness. As a matter of fact traces of methyl alcohol have been

* American Druggist, March 9, 1903.

found in the fermented juices of plums, grapes, mirabelles, cherries and apples; in the fermented and unfermented juice of black currants and also in brandy.*

Trillat has reported that he has found in certain low-priced liquors methyl alcohol in quantity sufficient to indicate the addition of 5–15 per cent. of methylated alcohol.†

This naturally brings up the question: What are the physiological effects of methyl alcohol, and can it be substituted for ethyl alcohol for internal use? It would be interesting to consider at this point the physiological effects of the alcohols in general, and of methyl and ethyl alcohol in particular.

Gibbs and Reichert ‡ found that all the common alcohols have the same physiological action as ethyl alcohol, but the intensity of the action varies. Dogiel § and Dujardin-Beaumetz ‖ both find that of the first five primary alcohols of the methane series, the poisonous effects varied regularly from methyl alcohol, the least poisonous, to amyl alcohol, the most poisonous. This is also the conclusion of Vandevelde.¶ Vandevelde also finds that isopropyl alcohol has a less powerful action than normal propyl alcohol. According to Shapiroff,** a tertiary alcohol acts as a depressant, while its isomeric primary alcohol has a stimulating effect. Thierfelder and Mering have made physiological tests of tertiary alcohols †† on dogs and rabbits. Tertiary amyl alcohol produces a more powerful effect than tertiary butyl alcohol; the isomeric primary alcohols, as before stated, comparing in the same way.

The physiological effects of ethyl alcohol upon the nervous, digestive and circulatory systems of man, have received much attention from pharmacologists. It is known that it is oxidized in the body to some extent in place of fat and protein. This fact, which has been studied in detail by Atwater, technically classes alcohol as a food. An interesting discussion of this fact, and also of the effects of alcohol, may be read in Cushny's Text Book of Pharmacology and Therapeutics.

On the other hand, according to the most able investigators, the action of methyl alcohol is distinctly different from that of ethyl alcohol. This was first shown by the work of Pohl,‡‡ who studied the oxidation of both

* J. Wolff, Comptes Rend., *131*, 1323.

† Comptes Rend., *128*, 438.

‡ Amer. Chem. Jour., *13*, 361.

§ Pflüger's Arch. (8), p. 605.

‖ Comptes Rend., *83*, 80.

¶ Chem. Centralbl., 1900 (i), 481.

** Jour. Chem. Soc. (London), *52* (II), 857.

†† Zeit. physiol. Chem., *9*, 511.

‡‡ Arch. für Exp. Phar. and Path., *31*, 281.

methyl and ethyl alcohol in the animal body. The effect of methyl alcohol is slower and more prolonged when administered in poisonous doses, and the stupor following its administration is deeper and lasts longer than the coma following intoxication from the use of ethyl alcohol. Partial, and also total, blindness, it is said, have been caused by the use of methyl alcohol in medicines and drugs where ethyl alcohol is ordinarily used.

The recent work of Professor Reid Hunt, of Johns Hopkins University, bears directly upon this subject.* His results show very clearly that the methyl alcohol is much more poisonous than ethyl alcohol. Ethyl alcohol is oxidized to carbon dioxide and water; methyl alcohol, however, is oxidized only as far as formic acid. Formic acid per unit body weight is said to be six times as poisonous as methyl alcohol; moreover, it is very slowly eliminated from the body.†

It thus appears that the use of methyl alcohol for internal use is to be condemned. On account of its occasional use as an adulterant for ethyl alcohol, the need of the chemist having a good test to recognize its presence in these mixtures is apparent.

As the analytical chemistry of these alcohols depends considerably upon the chemical properties of the corresponding aldehydes, it is well to consider the chemical behavior of these bodies with some completeness before proceeding further with the subject of the alcohols.

Formaldehyde and acetaldehyde are the first products of oxidation of methyl and ethyl alcohol respectively. The former is gaseous at ordinary temperatures (B. P. −7° C.), while the latter is a volatile liquid (B. P. 21° C.). The oxidation to aldehyde is advantageously shown by suspending a heated platinum spiral in a mixture of the alcohol vapor and air. Trillat has shown that methylal is also formed during the operation with methyl alcohol, and that acetal is formed when ethyl alcohol is used. Only about 1.5–2 per cent. of the alcohol is oxidized by this process.‡

On account of the double linking between the carbon and the oxygen atom the aldehyde molecules are distinguished by the ability to additively combine with certain substances—ammonia, bisulphites, hydrocyanic acid—and with each other—polymerization. The principal polymerides of formaldehyde are metaformaldehyde or trioxy-methylene $(CH_2O)_3$ and paraformaldehyde $(CH_2O)_n$; and of acetaldehyde we have paraldehyde $(C_2H_4O)_3$ and metaldehyde $(C_2H_4O)_n$. Both acetaldehyde and formaldehyde are soluble in water. The concentrated solution of formaldehyde, 40 per cent., is a commercial article. On boiling a solution of either aldehyde a part is driven off, rapidly at first, but more slowly as the operation

* Bulletin Johns Hopkins Hospital, Aug.–Sept., 1902, p. 213.

† Reese's Med. Jurisprudence and Toxicology.

‡ Comptes Rend., *132*, 1227, 1495.

is continued. The aldehyde seems to decrease in volatility. This behavior is especially noticeable with formaldehyde, which can be detected in the last few drops of an aqueous solution which has been evaporated in an open dish. H. M. Smith and H. D. Richmond have established a formula showing the percentage of formaldehyde distilling over from an aqueous solution.*

Two explanations may be offered for this behavior of aldehydes: (1) A part of the aldehyde molecules in water at ordinary temperatures or under the action of heat polymerize to molecules of higher molecular weight, thus decreasing the volatility. (2) On account of the unsaturated linking between oxygen and carbon in the simple aldehyde molecule we may have the formation of a dihydroxy (glycol) structure by reaction with water molecules; thus formaldehyde would form methylene glycol, $CH_2(OH)_2$; and with acetaldehyde, ethylidene glycol, $CH_3CH_2(OH)_2$. This is the idea of Nef, of Chicago University.† The introduction of two hydroxy-groups into the molecule would explain the decreased volatility.

In support of this glycol structure of aldehydes attention may be called to the compound, methylal $CH_2(OCH_3)_2$, the methoxy derivative of methylene glycol. The compound is soluble in water and quite stable. Acetal, $CH_3CH(OC_2H_5)_2$ is the ethoxy derivative of ethylidene dihydroxide; it is also quite stable. By the substitution of chlorine for hydrogen in the methyl group of the aldehyde molecule, the dihydroxy structure becomes stable and we have the solid crystallized compound, chloral hydrate or trichlorethylidene dihydroxide, $CCl_3CH(OH)_2$.

Estimation of the molecular weight of formaldehyde by the cryoscopic method points to the presence of a body of higher molecular weight than that of $CH_2O$. Tollens obtained a value between 34 and 35,‡ while Kraut, Eschweiler and Grossmann § obtained values ranging from 32.6 to 40. A concentrated solution of formaldehyde, diluted with cold water, and the cryoscopic method applied at once, gave a molecular weight of 49. These investigators assign the formula $(CH_2O)nH_2O(n=6 \text{ or } 8)$ to formaldehyde in solution.‖

The formula $CH_2(OH)_2$ cannot be considered proven by the result 49, because, in the determination of this value, the solvent water entering into combination with the aldehyde was not subtracted from the weight of the solvent taken; however, if this fact is taken account of, a value is obtained considerably removed from the value 49. The production then of dihydroxyl structure is thus far not substantially sustained by experimental proof.

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* Analyst, *22*, 92.

† Annalen, *298*, 202.

‡ Ber., d. d. Chem. Ges., *21*, 1566, 3503.

§ Annalen (*258*), 95.

‖ M. Delepine, Bull. Soc. Chim. (*17*), Ser. III, 849.

An interesting example of the polymerizing power of formaldehyde was first shown by Loew * when he prepared formose from formaldehyde by allowing it to polymerize in the presence of lime. This body, in many respects, is like glucose. It is a gummy, non-crystalline mass, soluble in water, slightly soluble in alcohol, and insoluble in ether. It reacts with phenyl hydrazine and Fehling's solution in the same way as glucose. This seems to be substantial support for the biological theory that the chlorophyll of the plant under the action of the sunlight acts on the carbon dioxide absorbed from the air and forms formaldehyde which polymerizes to produce the carbohydrates—sugars, starches, celluloses—of the plant.

For the quantitative estimation of formaldehyde, the ammonia method proposed by Legler † is one of the most convenient. A known quantity of the solution to be estimated is added to an excess of standard solution of ammonia, when the formaldehyde is converted into hexamethylenetetramine.

$$6CH_2O+4NH_3=(CH_2)_6N_4+6H_2O.$$

The excess of ammonia is then titrated with a standard acid solution using methyl orange or litmus as an indicator. The basic property of the hexamethylenetetramine must be taken into account with certain indicators, but when litmus or phenolphthalein is used this is not necessary. A study of these facts and of this method in general has been made by Losekann ‡ and Eschweiler.§

Trillat ‖ modifies this method by passing steam through the mixed solutions of standard ammonia and aldehyde, and then estimating the ammonia in the distillate with standard acid.

By heating formaldehyde with standard alkali the following reaction takes place:

$$2CH_2O + NaOH = NaCHO_2 + CH_3OH.$$

The excess of alkali is easily estimated volumetrically. This method is also due to Legler.

The method of Blank and Finkbeiner appears to be an excellent one.¶ The formaldehyde solution is mixed with $\frac{N}{2}$ NaOH, a quantity of hydrogen peroxide as a 3 per cent. solution is added, which thus oxidizes the formaldehyde to formic acid; this is at once neutralized by the alkali present. The excess of alkali is titrated with $\frac{N}{2}$ acid.

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* Jour. für prak. Chemie, *141*, 321.

† Ber., d. d. Chem. Ges., *16*, 1333.

‡ Ber., d. d. Chem. Ges., *22*, 1565.

§ Ber., d. d. Chem. Ges., *22*, 1929.

‖ Comptes Rend., *116*, 891.

¶ Ber., d. d. Chem. Ges., *31*, 2979.

Many other methods have been proposed for the estimation of formaldehyde. Among these are the methods of Grutzner,* Romijn,† Brochet and Cambier,‡ Clowes and Tollens,§ and H. M. Smith.‖

Since acetaldehyde is not an important commercial article like formaldehyde, we have not the variety of methods for its quantitative estimation. A method worked out by E. Rieter ¶ depends upon estimating the amount of sulphurous acid which will additively combine with the acetaldehyde, by means of a standard solution of iodine. X. Rocques ** employs the same principle but uses alkali bisulphite in place of sulphurous acid.

Formaldehyde has been used quite extensively as a preservative for foods and especially for milk. According to Rideal and Foulerton †† one part of formaldehyde in 50,000 parts of milk will preserve it for 24 hours. They conclude that this amount does not affect the digestibility of the milk; this statement, however, is not supported by other investigators. Formaldehyde exerts a peculiar effect upon albuminoids, coagulating and rendering them insoluble and hence indigestible. Apparently it combines with them to some extent, for it is not possible to recover by distillation much more than one-half the quantity usually added to milk for preservative purposes. Formaldehyde is known to exert toxic effects and it is now quite generally conceded that its use as a preservative should be entirely prohibited.

Thus the need of ready tests for formaldehyde has arisen, and as a result the literature abounds with descriptions of certain chemical properties and color reactions which have been proposed as qualitative tests. Only a few of these can be given in this article.

An ammoniacal solution of silver nitrate is rapidly reduced by even small quantities of formaldehyde, the silver being deposited as a mirror in the tube.

The Schiff reagent for aldehydes in general consists of a solution of magenta decolorized by saturating with sulphur dioxide. On adding an aldehyde the color is restored in proportion to the amount of aldehyde present.‡‡

Trillat has proposed a test using dimethylaniline,§§ but Pilhashy ‖‖ has

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* Arch. Pharm., *234*, 634.

† Zeit. anal. Chem., *36*, 18.

‡ Comptes Rend., *120*, 449.

§ Ber., d. d. Chem. Ges., *32*, 2841.

‖ Analyst, *21*, 148.

¶ Chem. Centrbl., 1896 (II), 368.

** Comptes Rend, *127*, 524, 764.

†† Public Health, (England), 1899, No. 11.

‡‡ Allen's Commercial Organic Analysis, 3d Ed., 218.

§§ Comptes Rend., *116*, 891.

‖‖ Jour. Amer. Chem. Soc., *22*, 132.

shown this test to be valueless from the fact that the end reaction is due rather to dimethylaniline and not to formaldehyde.*

The morphine test for formaldehyde is a very delicate one, providing the dilution does not exceed 1 : 1000. A crystal of morphine is placed in a drop of concentrated sulphuric acid on a white porcelain surface, and the crystal touched with a glass rod moistened with the solution to be tested. A purple coloration is obtained in the presence of formaldehyde.

Lebbin's test employs a solution of resorcinol in strong sodium hydroxide; the addition of formaldehyde, followed by boiling the mixture, gives a red color. †

Vanino proposes to employ phloroglucinol in place of resorcinol, a deep red color being formed at once and without boiling.‡

Mulliken and Scudder use resorcinol in the presence of sulphuric acid, in place of alkali in Lebbin's test.§ The resorcinol is added to the suspected formaldehyde solution, and concentrated sulphuric acid poured down the side of the tube so as to form a layer at the bottom. A rose-red zone with pink to purple-red flakes forms at the line of demarcation of the layers.

Hehner has shown that formaldehyde can be detected in milk by adding to the article contained in a test tube strong sulphuric acid. A blue color is produced above the acid layer. The reaction is said to be rendered more delicate by the presence of a minute quantity of ferric chloride.‖

Phenylhydrazine with sulphuric acid has been used for the detection of formaldehyde, a green color resulting.¶

Rimini uses sodium nitroprusside in connection with phenylhydrazine and sodium hydroxide, a blue color resulting.**

A characteristic color reaction for acetaldehyde has been described by Simon.†† If a liquid containing acetaldehyde is added to a solution of trimethylamine containing a few drops of a solution of sodium nitroprusside, a blue color slowly forms. This reaction is not given by formaldehyde, and will show the presence of one part acetaldehyde in twenty five thousand.

Returning now to the subject of the alcohols, we have seen the necessity of having a good test for the detection of methyl alcohol in ethyl alcohol even in small amounts.

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* For another test by Trillat, see Comptes Rend., *127*, 232.

† Zeit. anal. Chem., *36*, 518; Pharm. Zeit., 1896, 681.

‡ Pharm. Centralh., *40*, 101.

‖ Amer. Chem. Jour., *21*, 267.

§ Analyst, *21*, 157.

¶ Istrati, Jour. Soc. Chem. Ind., *17*, 954.

** Chem. Centralb., 1898, (*1*) 1152.

†† Comptes Rend., *125*, 1105.

One of the first effective methods was worked out by Rich and Bardy,* who by a series of operations obtain methyl violet from the methyl alcohol. This test, though very delicate and distinctive, requires about a day to carry out. A test requiring less time is therefore to be preferred.

Habermann and Oesterreicher † say that an alkaline solution of potassium permanganate is decolorized more rapidly by methyl than by ethyl alcohol. Schoorl has pointed out ‡ that when this difference is observed, it is due to traces of acetone and other easily oxidized impurities in the methyl alcohol, and not to the methyl alcohol itself. This explanation I have found to be completely verified by experiment.

The test of J. T. Miller depends upon the oxidation of the methyl alcohol to formic acid by means of sulphuric acid and potassium dichromate. The formic acid is then detected by its strong reducing action on silver nitrate in the presence of acetic acid. This test would be an excellent one were it not for the fact that small quantities of formic acid are produced by the oxidation of other compounds, such as acetone, and even by ethyl alcohol.§

A method of procedure which makes the test very simple is to oxidize the methyl alcohol to formaldehyde by hot copper oxide, and then apply some of the many tests for this body to the resulting product. This forms the basis of the test proposed by Mulliken and Scudder, of the Mass. Inst. of Technology.‖ A copper spiral made by winding a copper wire around a pencil is heated in a Bunsen flame until quite hot, and then plunged into the diluted spirit contained in a test-tube. Deoxidation occurs at once, and a bright copper surface is produced. By this operation the alcohols present are oxidized to aldehydes. The coil is again heated and plunged into the diluted spirit. This is repeated three or four times more, according to the dilution of the spirit. To the resulting liquid, which consists of a solution of the alcohols and aldehydes in water, the authors apply the sulphuric acid and resorcinol test previously mentioned for the detection of formaldehyde. One drop of a 0.5 per cent. solution of resorcinol in water is added to the liquid, and the mixture poured carefully into an inclined test tube containing a quantity of concentrated sulphuric acid. A rose-red zone with pinkish flocks appears if formaldehyde has been formed in the oxidation process. In the last article by these authors the suggestion is made to remove the acetaldehyde and excess alcohol by distilling these out of the solution in a partial vacuum. The test tube containing the liquid resulting after using the copper coil is fitted with a

* Comptes Rend., *80*, 1076.

† Zeit. anal. Chem., *40*, 721.

‡ Zeit. anal. Chem., *41*, 426.

§ Allen's Commercial Organic Analysis, Vol. 1, 3d ed., 81.

‖ Amer. Chem. Jour., (*21*), 266; (*24*), 444.

rubber stopper carrying a capillary tube point and a delivery tube. This delivery tube is connected to a suction flask, which in turn is connected to the water pump. By lowering the pressure to 20 mm. the acetaldehyde and unoxidized alcohols, with some water, are expelled with gentle boiling when the test tube is surrounded with water at 25°–30° C. The test for formaldehyde is then made upon the liquid remaining in the test tube in the manner heretofore described.

A short time ago Dr. A. B. Prescott published an article* giving a test whereby one part of methyl alcohol in twenty parts of ethyl alcohol could be detected. The test, stated briefly, is made as follows: Take about 1 Cc. of the alcohol to be tested and add 8 Cc. of water; oxidize the diluted alcohol by repeated plunges of a red hot and superficially oxidized copper coil until the coil ceases to be entirely reduced. This should require about six plunges. Add to the liquid about 6 Cc. of a 3 per cent. solution of hydrogen peroxide. Mix well, allow it to stand a few minutes and then filter; then add 2 Cc. of a 10 per cent. solution of sodium thiosulphate. Shake well and then allow to stand a few moments; transfer to a white porcelain dish and add 3 Cc. of a solution of one gram phloroglucinol in 100 Cc. of 20 per cent. sodium hydroxide solution; a bright red coloration indicates formaldehyde and therefore methyl alcohol in the original spirit.

The test thus consists of three parts, (1) The conversion of the alcohols into aldehydes, (2) Treatment to remove acetaldehyde, (3) Color test for formaldehyde.

The first part of the test, it is seen, is the method employed by Mulliken and Scudder for the oxidation of the alcohols. The hydrogen peroxide is added in excess to oxidize the acetaldehyde formed along with the formaldehyde. A. Harden has stated † that formaldehyde is incompletely and slowly oxidized by hydrogen peroxide when the latter is in excess. Kastle and Loevenhart have made an extensive study of the rate of the action between formaldehyde and hydrogen peroxide. They state that the action is very slow at ordinary temperatures, which thus agrees with Harden's statement. ‡

Excess of hydrogen peroxide must next be removed from the mixture, for if it be present a blue coloration appears, which may partly mask the color due to formaldehyde.

For this purpose the solution of sodium thiosulphate is added, which reacts with hydrogen peroxide according to the equation—

$$2Na_2S_2O_3 + H_2O_2 = 2NaOH + Na_2S_4O_6.$$

The addition of an excess of the thiosulphate does not interfere with the

* Pharm. Archives, Vol. 4, 1901, No. 5.

† Proc. Chem. Soc. (London), 1899, 158.

‡ Jour. Amer. Chem. Soc., *21*, 262.

color reaction obtained on adding the phloroglucinol solution, which is the next step in the operation.

The use of phloroglucinol in alkali was suggested by Jorisson * and also by Vanino † for the detection of formaldehyde in milk. Vanino has shown that the red coloration is most intense with a .5 per cent. solution of formaldehyde. The reaction is said to detect four parts of formaldehyde in one million. The coloration is not obtained with strong solutions of formaldehyde, but the best results are obtained with quantities less than .5 per cent.

The test just described has been carefully reviewed in this laboratory, and a discussion of the same will now be made with some detail.

In obtaining the alcohol to be tested from the material with which it is mixed, the precaution stated by Mulliken and Scudder is to be observed: "Use for the test only that part of any mixture that can be completely distilled at a temperature between 50° and 100° C., and which after distillation gives a clear, colorless solution when diluted with two or three volumes of water."

1 Cc. of the alcohol to be tested is diluted to 10 Cc. with distilled water. If the alcohol is already dilute, a correspondingly larger amount is diluted to 10 Cc. The original test states that the coil ceases to be reduced after six or eight plunges. This I find is not clearly carried out in practice. On the contrary, the coil appears to be reduced as readily after six or eight plunges as at first, whether it be ethyl alcohol or a mixture of alcohols which is being oxidized. To be sure, at some of the plunges some of the oxide was reduced only to cuprous oxide, and at some other points the cupric oxide was apparently unchanged, but with later plunges the reduction would be more complete. This repeated reduction is due, at least in part, to the fact that the aldehydes formed are oxidized to acid and perhaps to other products by the hot copper oxide.

It was therefore thought advisable to plunge the coil in the liquid six or seven times, which always oxidizes enough of the alcohols for the test. The test-tube containing the alcohol is floated in a beaker of cold water, which by keeping the solution cool prevents undue loss of alcohol and aldehyde.

It is not necessary to heat the coil to a bright incandescent red; the reduction proceeds just as well if the coil be heated to a dull redness, which shows distinctly when the coil is removed from the flame. The coil should be withdrawn from the liquid before it has cooled completely, as there seems to be more tendency for the aldehydes to oxidize to acids when the coil is allowed to remain in the liquid until it has acquired the same temperature. It is plunged into cold water, as soon as withdrawn, to prevent oxidation, as it coats itself more uniformly with copper oxide when the bright coil is heated.

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* Jour. de Pharm. et de Chim., 1897 (2), 167.

† Pharm. Centralh., *40*, 101.

As has been previously stated, both acetaldehyde and formaldehyde when in water solution are held more firmly than alcohol or any other volatile liquid which may be mixed or dissolved in water. Mulliken and Scudder say in this connection: "Acetaldehyde is easily and completely expelled from aqueous solutions by persistent boiling in a vessel provided with some condensing arrangement that will prevent too rapid loss of water vapor. Dilute solutions of formic aldehyde, on the contrary, lose their aldehyde very slowly under this treatment, it being firmly held, partly in a polymerized condition, by the hot water. Such solutions will, however, lose all their formic aldehyde when the distillation is rapid or is pushed too far." The commonly accepted reasons for this low volatility have been previously stated, namely, polymerization, and the formation of glycols by condensation with water.

The use of the hydrogen peroxide as a means for removing the acetaldehyde was first studied. If used as described in the original test, the acetaldehyde is not removed, but enough remains to give the orange color which forms slowly. The phloroglucinol in alkali test solution when formaldehyde is present, either alone or with acetaldehyde, gives a bright scarlet coloration, which forms quickly and persists for two or three minutes or more, according to the amount of formaldehyde present. As stated above, the color with acetaldehyde is orange and forms much less rapidly. But if the solution resulting from the oxidation of acetaldehyde is boiled for a moment, a pink or reddish color, somewhat approaching that due to formaldehyde is obtained on adding the phloroglucinol test solution. This color, however, is not so brilliant a red as that given by formaldehyde and it also fades away much more rapidly. This red color appeared at first to be due to acetaldehyde, the solution of which in water if boiled gave a different coloration than before boiling. But this can hardly be the explanation, since a boiled solution of pure acetaldehyde does not show this decided difference from the solution not boiled. It is more probable that some other product besides the acetaldehyde results from the action of the copper spiral on the diluted ethyl alcohol, and that this body, through some change caused by the boiling, causes a red color on adding the phloroglucinol. Mulliken and Scudder state* that their test gives a red color due to some unknown product when pure ethyl alcohol is oxidized without first diluting it with water, but this interference does not result if the alcohol be diluted before oxidation. It would seem that this unknown substance is formed with dilute spirit also, but its presence is not shown by the resorcinol and sulphuric acid test.

To return to the use of hydrogen peroxide: After much experimentation, it has been found impractical to remove acetaldehyde and the unknown body causing the red color by this method, so that an orange or pink color is not developed on adding the test solution. The acetaldehyde

* Amer. Chem. Jour., *24*, 467.

is not entirely removed, even if the liquid be heated with an excess of hydrogen peroxide in a flask with a condenser at the boiling point for one hour. Although both aldehydes are oxidized in acid solution, it is found that neither is completely removed by any ordinary operation, such as would be convenient to employ in the test. In alkaline or neutral solution, both aldehydes with other substances are quite rapidly oxidized and no color is obtained with phloroglucinol. Thinking perhaps that the excess of alcohol present exerted some influence, the liquid after oxidation was evaporated on the water bath to one-half its volume, this serving to remove the excess alcohol with some of the acetaldehyde. After treatment of this solution with hydrogen peroxide, the same coloration as was observed in the preceding case always appeared on adding the phloroglucinol solution. In all these experiments, carried out to test the completeness of the removal of the aldehyde and color-producing bodies, the liquid was prepared by oxidizing pure diluted ethyl alcohol, and seeing if it were not possible to remove these bodies so completely that very little color was produced on adding the phloroglucinol.

With the failure of this procedure, some other had to be tried. The plan of evaporating the solution under reduced pressure, as practiced by Mulliken and Scudder, was tried. Acetaldehyde is probably removed by this process, but the body producing the red coloration was not, as the red color at once appeared on adding the phloroglucinol.

In a foot-note of the article by Mulliken and Scudder, it is stated that the acetaldehyde may be removed by boiling down the liquid, after oxidation with the copper spiral, in an open test-tube until the odor of the aldehyde disappears. A trial of this method gave the same result as preceding experiments: the reddish color, due to the unknown body present, was developed. In fact, if the evaporation be continued until one-half to one c. c. of liquid remains, this liquid will still give the reddish coloration. It does not seem practical, therefore, to attempt the complete removal of all the color-producing bodies for this test. But this operation removes the acetaldehyde as well as the method by evaporation in a vacuum, and what is better, the other substance producing the red coloration appears to be partly removed. Moreover, the operation recommends itself on account of its simplicity. The following plan of carrying out the test gives conclusive results:

After oxidation of the 10 Cc. of diluted alcohol the filtered liquid is boiled in an open test tube until its volume is 5 or 6 Cc. The tube is cooled and its contents poured into a porcelain crucible or small evaporating dish. Five drops of the phloroglucinol reagent are added from a pipette, when if methyl alcohol were present in the alcohol tested, even if but one part in twenty, the liquid acquires a bright red color, which persists for two or three minutes. If ethyl alcohol were present a faint reddish color at once appears, but fades away rapidly.

The distinction is more clearly seen if the two cases are carried through the operation side by side, one with the mixed alcohols (1 : 10 or 1 : 20), the other with pure ethyl alcohol. After a few trials the operator can tell at once if methyl alcohol were present when the reagent is added. On allowing the two dishes to stand after adding the phloroglucinol, from one-half to one hour, the liquid in the dish which contained formaldehyde fades to a faint and dirty red or orange color. The liquid in the other dish, which contained only acetaldehyde, changes to a blue color.*

The test as thus carried out is made very short, the manipulation with hydrogen peroxide and sodium thiosulphate being dispensed with. Experiments were also made using other color reactions for formaldehyde, instead of the phloroglucinol reaction, the rest of the test being carried through as before stated. The tests tried are all very distinctive for formaldehyde alone, but are much impaired if acetaldehyde be present.

Lebbin's test gives a bright red coloration with formaldehyde, but if acetaldehyde is present in any quantity the color is obscured by the yellow resinous material produced by the latter with alkali. If the solution be boiled to remove acetaldehyde before adding the resorcinol and alkali, as the test directs, a red color is obtained in the final reaction, bright if methyl alcohol was present, and very faint if ethyl alcohol was present alone.

The resorcinol and sulphuric acid test used by Mulliken and Scudder is very brilliant when the formaldehyde is pure, but if acetaldehyde is removed by boiling in an open test tube enough formaldehyde is removed at the same time to spoil the test.

The phenylhydrazine test as recommended by Pilhashy,† according to my experimentation did not give a greenish coloration with formaldehyde, but a white precipitate insoluble in the dilute sulphuric acid present, which clotted like silver chloride on shaking. No precipitate appears if acetaldehyde alone be present; the liquid remains perfectly clear.

Rimini's test using phenylhydrazine hydrochloride and sodium nitroprusside gives a deep blue color with formaldehyde, acetaldehyde gives a red color, while the mixed aldehydes produce a purple coloration. On boiling the oxidized diluted alcohols and applying Rimini's test, the blue color is quickly developed, if the alcohol contained methyl alcohol, while if the article tested was ethyl alcohol the coloration produced is only a slight yellow.

It is not practical to estimate the amount of methyl alcohol present by employing the phloroglucinol test colorimetrically. Dilution of the red

* This is probably due to the oxidizing action of the air on the phloroglucinol. It may also be obtained by pouring a little of the phloroglucinol reagent into an open dish, and either allowing it thus to stand or adding a small quantity of hydrogen peroxide solution.

† Jour. of Amer. Chem. Soc., *21*, 132.

solution with water favors a rapid fading of the color; the color also fades more rapidly if the solution has been boiled before adding the phloroglucinol. If mixtures containing different proportions of methyl alcohol be oxidized by the copper spiral and the test applied, the color may differ slightly in intensity, but on standing they all acquire about the same color, due to the deepening of the color produced by acetaldehyde. If the attempt is made to remove acetaldehyde by boiling, a part of the formaldehyde is lost, which thus impairs the quantitative determination.

One or two quantitative methods for the determination of methyl alcohol in ethyl alcohol may be mentioned. A method worked out by A. Lam* depends upon the fact that the specific gravity of methyl iodide is somewhat greater than that of ethyl iodide. The mixed spirit is treated with iodine and phosphorus, which converts the alcohols into the iodides. These are distilled off, purified, dried, and the volume obtained is then noted. The specific gravity of the mixed iodides is now taken very carefully, and by reference to tables worked out by the author, the quantity of methyl iodide in the mixture is obtained.

J. K. Haywood† has experimentally determined the boiling point curve for mixtures of methyl and ethyl alcohol, which makes it possible to determine the percentage of each alcohol by observing the boiling point of the mixture.

As stated by Allen, the accurate determination of methyl alcohol in the presence of ethyl alcohol is very difficult. He mentions two or three methods which, while fairly satisfactory, are somewhat difficult in manipulation and are only approximate.

This experimentation was undertaken at the suggestion of Dr. A. B. Prescott, and I would take the present opportunity to thank him for his many hints during the progress of the work, as well as for the use of his private laboratory.

*University of Michigan Chemical Laboratory, June 5, 1903.*

## THE ACTION OF OXIDIZING AGENTS, PARTICULARLY POTASSIUM PERMANGANATE AND IODIC ACID, UPON MORPHINE.

C. W. JOHNSON, PH.D.

Keeping in view the constitution of morphine as adopted by Knorr and others, the writer has undertaken an experimental study of certain of its oxidation reactions in order to determine the chemical character and composition of the oxidation products, or any of them, and the limits which govern their formation.

These reactions of oxidation occur in the operation of an important antidote for morphine and in color tests necessary to the identification of

* Zeit. angew. Chem., 1898, 125.

† Jour. Amer. Chem. Soc., *21* 994.

the alkaloid. The decisive reactions of morphine especially in the formation of color compounds, would seem to promise a possible discovery of individual products throwing some light upon its chemical constitution.*

This has consequently been one of the objects of the investigation. In establishing fixed limits for the reactions of oxidation, the immediate object has been to obtain the advantage of a knowledge of these limits in the use of oxidation antidotes, and in the analytical tests of identification.

## HISTORICAL.

The products of the oxidation of morphine as obtained by the different workers have little in common. Kosmann† reported that potassium permanganate oxidized morphine to glucose and nitric acid. Broockmann and Polstorff‡ and Polstorff§ obtained a compound identical with

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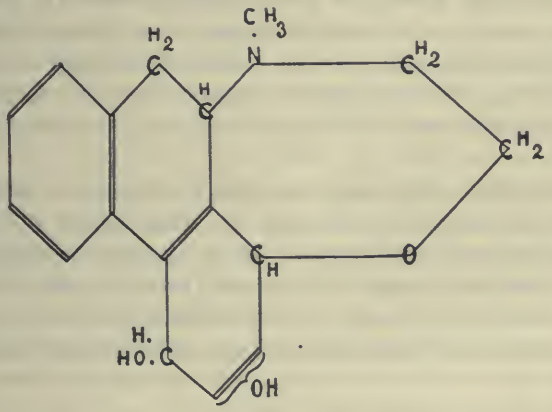
*The constitution of morphine as proposed by Knorr (Ber. deut. chem. Ges., *32*, 746) and accepted by Vongerichten (Ber. deut. chem. Ges., *33*, 352, 359), may be briefly stated as follows: Morphine is a tetrahydro-derivative of phenanthrene. The bivalent complex $CH_3—\overset{|}{N}—CH_2—CH_2—\overset{|}{O}$ is linked to the phenanthrene nucleus at two points, the nitrogen and oxygen each being joined to a dihydrobenzene nucleus.




Morphine contains one oxygen in an hydroxyl group with a phenol character (Matthiessen and Wright, Ann. der Chem. Spl., 7, 364; Grimaux, Compt. rend., *92*, 1140, 1228; *93*, 67, 217, 591); one in an hydroxyl group with alcoholic character (Hesse, Ann. der Chem., *222*, 203); both hydroxyl groups being joined on the same benzene nucleus; also an indifferent oxygen atom (Vongerichten, Ann. der Chem., *210*, 105) with an ether-like linking. Morphine is a tertiary base; it contains a methyl group linked to the nitrogen, the nitrogen being in a ring and linked to two different carbon atoms (Hesse, Ann. der Chem., *222*, 232; Vongerichten and Schrötter, Ber. deut. chem. Ges., *15* (1), 1484; Knorr, Ber. deut. chem. Ges., *22*, 181; Grimaux, Compt. rend., *93*, 591)

†Bull. Soc. Chim. (N. S.), *30*, 145.

‡Ber. deut. chem. Ges., *13*, 91.

§Arch. der Pharm. (3), *17*, 401.

Flückiger's * oxymorphine by treating morphine with potassium permanganate and potassium carbonate. They proved this product was oxydimorphine with the formula $C_{34}H_{36}N_2O_6$, each of two molecules of morphine losing an atom of hydrogen, the residues uniting to form a molecule of this oxidation product. Upon treating morphine with an alkaline solution of potassium permanganate, Barth and Weidel † obtained a brown solution which, after several months standing, showed no trace of crystals. The salts of this product were also amorphous. It was found by Dr. William Moor,‡ that a solution of one part of potassium permanganate was instantly decolorized by a solution of one part of morphine, the filtrate appearing, after the removal of the precipitate, almost colorless and nonreactive to tests for morphine. In this reaction the permanganate was changed to manganese dioxide, potassium hydroxide and oxygen, the morphine being oxidized to some non-poisonous compound § the nature of which was not determined. Dr. Moor proposed the use of potassium permanganate as an antidote for morphine poisoning, demonstrating its efficiency by a series of experiments performed upon himself. Following the publication of Moor's proposition, medical literature ‖ was crowded with articles from different physicians, discussing the proposed antidote, and reporting cases in which it had been put to test. Dr. Sharp ¶ made an extensive study of the antidotal properties of permanganate, and reported that morphine could not be completely decomposed by permanganate, the filtrate and precipitate obtained after the reaction yielding, when extracted with hot amyl alcohol, 6 per cent. of undecomposed morphine.

As a test for the identificationof morphine in toxicological work, Lefort,** in 1861, proposed the use of iodic acid. He stated that, in 1830, Sérullas †† first announced that a solution of a salt of morphine when mixed with a solution of iodic acid, caused a red coloring of the liquid and a liberation of iodine. Since Sérullas found no other alkaloid which acted similarly to morphine, he proposed iodic acid as an agent for detecting morphine, and

* Flückiger's Lehrb. der Pharm. Chem., 375.

† Monatsh. für Chem. (1883), *4*, 700.

‡ Med. Record, *45*, 200, 442, 644; *47*, 266. Brit. Med. Journ., 1895, *1*, 1369.

§ See also Toth, L. Schmidt's Jahrbuch, *229*, 135. Dr. Julius Schmidt's Pflanzenalkaloide, 1900, 162.

‖ Med. Rec., *45*, 316, 459, 460; *46*, 343, 345, 569; *47*, 301, 303, 648; *48*, 858; *51*, 27; *52*, 671; *58*, 616; *60*, 545. Med. News, *64*, 380, 491, 514, 699; *65*, 104. Ther. Gaz., *19*, 163, 576, 674. Jour. Am. Med. Assoc., 1894, 755. Brit. Med. Jour., 1896, 785, 1193, 1194. Med. Age, 1901, 771. Proc. Mich. State Pharm. Assoc., 1900, 43. Drug. Circ., Jan., 1902, 2.

¶ Ther. Gaz., 19, 651.

** Jour. de Pharm., *40*, 97; Zeit. anal. Chem., *1*, 134.

†† Ann. de Chim. et de Phys. (2), *43*, 211; *45*, 274.

found it to respond to a solution containing 0.001 grain of the alkaloid. Liebig confirmed this reaction, and stated that a yellow color could be detected when the solution contained $\frac{1}{7000}$ part of morphine. But since many organic substances liberate iodine from iodic acid, confidence could not be placed in this reagent alone in toxicological work. In 1836, Pelletier* found that strychnine, brucine, cinchonine, quinine and codeine formed definite salts with iodic acid, while morphine acted differently, first producing a color, due to the liberated iodine. The oxygen of the acid changed the morphine to a rose-colored compound, which Pelletier supposed was similar to the color compound produced by the use of nitric acid upon morphine. But the liberated iodine acted upon the rose-colored substance, the iodine being slowly absorbed, and produced an orange-brown compound, the nature of which Pelletier was not able to discover. Lefort found that ammonia caused the reaction product of morphine and iodic acid to become much darker, while other organic compounds which liberated iodine became colorless. A solution of morphine 1 : 100 was colored dark yellow upon adding iodic acid, and became darker upon adding ammonia. A solution of morphine 1 : 1000 with a solution of iodic acid became citron yellow; upon the addition of ammonia, it became the color of wine. A solution of morphine 1 : 10,000 with iodic acid produced scarcely an appreciable color, but by the addition of ammonia it became very apparent. The test, as applied by Lefort, consisted in dipping strips of unsized paper into the concentrated solution of extracted matter. After they had been dried and again wet for several times, they were moistened with a solution of iodic acid, partly dried, and again moistened with ammonia in sufficient quantity to leave a slight excess of the latter. The mahogany color, extending into the paper as far as it was wet, was an evidence of morphine, and was quite permanent. Dupré † claimed to be able to detect morphine 1 : 20,000 by use of iodic acid, ammonia and starch, avoiding the slightest excess of ammonia. He directed that a dilute solution of ammonia be carefully poured upon a mixture of solutions of iodic acid, starch and morphine in a test tube. Two colored rings appear, the lower one in the acid layer being blue, the upper one in the alkaline layer brown. Dupré objected to the test because aniline with iodic acid gives a violet color, becoming brown upon the addition of ammonia. In this instance no iodine is liberated, but a case might occur in which aniline would be mixed with some substance that would reduce iodic acid to iodine.

Fraude ‡ obtained a deep violet color then orange-brown by use of iodic

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* Ann. de Chim. et de Phys., *63*, 135.

† Chem. News *8*, 267.

‡ Ber. deut. chem. Ges. *12*, 1558.

anhydride upon morphine. Bell * did not consider the iodic test reliable because other substances liberated iodine, and when a mixture of morphine, iodic acid and carbon disulphide was treated with ammonia the color was destroyed. It is apparent that Bell here refers to the color in the carbon disulphide layer which, being due to free iodine, would be destroyed. An attempt was made by Holdermann † to make a quantitative estimation of morphine by use of iodic acid, sulphurous acid being used to titrate the liberated iodine. The method, however, is worthless because iodic acid continues to slowly liberate iodine. Sulphurous acid will also react with the iodic acid. Davoll ‡ stated that 0.00001 Gm. of pure morphine would respond to the iodic acid test. He directs that the iodic solution be applied to the dry residue, and all mixed intimately; chloroform in successive small portions is floated over this until it ceases to remove the pink color of iodine, the chloroform solution being removed by absorption with filter paper. Upon the addition of dilute ammonia the morphine will give a deep mahogany brown, not affected by chloroform, but changing back to yellow with hydrochloric acid. The test may be applied by adding ammonia without first washing with chloroform, thus avoiding some waste of the material.§ Causse ‖ heated a solution of morphine and iodic acid in an atmosphere of oxygen, and obtained for each molecule of morphine used a molecule of carbon dioxide, indicating that morphine has a carbonyl group.

Many other oxidizing agents have been used upon morphine, either as color tests for the detection of the alkaloid, or to obtain some oxidation product. Pelletier,¶ Lafort ** and Lindo †† proposed ferric chloride as an oxidizing agent for morphine, and discussed its merits as a reagent for a color test. Schär ‡‡ obtained a precipitate of Prussian blue, containing some Turnbull's blue, by the use of a mixture of ferric chloride and potassium ferricyanide on morphine. Chastaing,§§ after mixing morphine with nitric acid (sp. gr. 1.42), and evaporating twice, obtained an acid $C_{11}H_{11}NO_9$; upon evaporating three times, he obtained an acid $C_{10}H_9NO_9$. The potassium salt appeared to contain four atoms of the metal. The

* Analyst, *1879*, 181.

† Chem. Centrbl. *1889* (2), 542.

‡ Jour. Am. Chem. Soc. *16*, 806.

§ A. B. Prescott, chapter on Alkaloids in Am. Text Book of Legal Med. and Toxicology, now in press.

‖ Bull. Soc. Chim. (3) *21*, 166, 234.

¶ Ann. de Chim. et de Phys. (2) *50*, 272.

** Jour. de Pharm. *40*, 97.

†† Chem. News *37*, 158.

‡‡ Arch. der Pharm. *234*, 348.

§§ Jour. de Pharm. (5), *4*, 338, 343.

barium salt, $C_{10}H_5Ba_2NO_9$, was obtained as a white precipitate upon adding a solution of barium hydroxide to a solution of this acid. The acid * ($C_{10}H_9NO_9$) when heated with one molecule of water at 100° C. under pressure, yielded picric acid. Barth and Weidel † fused morphine with potassium hydroxide and obtained protocatechuic acid. Holdermann ‡ oxidized morphine with potassium dichromate and hydrochloric acid. The oxidation product, however, was not determined. An electric current § passed through a water solution of morphine acidified with sulphuric acid for four days, caused oxydimorphine to be formed. The solution was colored dark, but the nature of the color product was not discovered. Schützenberger ‖ treated morphine with silver nitrite and hydrochloric acid, and obtained oxymorphine ($C_{17}H_{19}NO_4$) which Polstorff proved was oxydimorphine ($C_{34}H_{36}N_2O_6$). Mayer ¶ oxidized morphine with nitrous acid, and obtained a compound which may have been impure oxydimorphine. Oxydimorphine was obtained by Hesse ** when a water solution of morphine hydrochloride was heated with potassium nitrite at 60° C. This oxidation product †† was also obtained when an ammoniacal solution of morphine was allowed to stand for three weeks in contact with the air. Kieffer ‡‡ was the first to observe that an alkaline solution of potassium ferricyanide decomposed an equivalent amount of morphine. Polstorff §§ dissolved morphine in a dilute solution of potassium ferricyanide, conducting carbon dioxide through the solution during the reaction. He proved that the oxidation product oxydimorphine has the formula $C_{34}H_{36}N_2O_6$, and that the reaction proceeds according to the equation $2C_{17}H_{19}NO_3 + 2KOH + 2K_3Fe(CN)_6 = 2H_2O + 2K_4Fe(CN)_6 + C_{34}H_{36}N_2O_6$. ‖‖ Hesse ¶¶ showed that the compounds oxymorphine of Schützenberger,*** oxydimorphine of Polstorff††† and dehydromorphine of Donath ‡‡‡ are all identical with pseudomorphine obtained from opium by Pelletier.§§§ Since

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* Chastaing, Compt. rend. *94*, 44.

† Monatsh. für Chem. *4*, 700.

‡ Chem. Centrbl., *1889* (2), 542.

§ Pommerehne, Arch. der Pharm. *235*, 367.

‖ Bull. Soc. Chim. *1865*, 176.

¶ Ber. deut. chem. Ges. *4*, 122.

** Ann. der Chem. *222*, 234, 248.

†† Broockmann and Polstorff Ber. deut. chem. Ges. *13*, 91; Nadler, Chem. Centrbl. *1873*, 675.

‡‡ Ann. der Chem. *103*, 271.

§§ Ber. deut. chem. Ges. *13*, 86; Arch. der Pharm. (3) *17*, 401.

‖‖ Ber. deut. chem. Ges. *19*, 1760; Hesse, Ann. der Chem. *235*, 231; Vongerichten, Ann. der. Chem. *294*, 209.

¶¶ Hesse, Ann. der Chem. *141*, 87; Spl. *8*, 267.

*** Bull. Soc. Chim. *1865*, 176; Chem. Centrbl. *1865*, 1088.

††† Ber. deut. chem. Ges. *13*, 86.

‡‡‡ Jour. prakt. Chem. (2) *33*, 559 (1886).

§§§ Ann. der. Chem. *16*, 49.

morphine is easily oxidized by the oxygen of the air,* it is probable that the pseudomorphine of Pelletier does not pre-exist in opium, but is formed in the manufacture of morphine.†

ACTION OF POTASSIUM PERMANGANATE UPON MORPHINE.

I. As a first step in a series of experiments conducted for the purpose of determining the products formed by the oxidation of morphine with potassium permanganate, 10 Cc. of a ½ per cent. solution of the permanganate were added, drop at a time, while stirring, to 250 milligrams of morphine dissolved in 10 Cc. of water (room temperature 20° C.). The instant the permanganate solution was brought into contact with the morphine, a slimy, brownish white precipitate was formed, which was later found to contain manganese dioxide. Upon treating the precipitate with dilute ammonium hydroxide, filtering and warming the filtrate upon a water bath, a white crystalline powder separated, which, after further purification, gave all the color tests for pseudomorphine. The filtrate from the slimy precipitate, which was faintly alkaline and of light-brown color, was shaken out several times with hot amyl alcohol. After evaporating the alcoholic solution, a small residue was obtained, which gave color tests for morphine. The greater part of the morphine, however, was found to have been changed to pseudomorphine.

II. The following experiment was performed for the purpose of finding how great a quantity of potassium permanganate could be decomposed by a given amount of morphine. To 500 milligrams of morphine hydrochloride dissolved in water were added 250 Cc. of a 1 per cent. solution of potassium permanganate. The resulting precipitate was filtered, washed, and treated with ammonium hydroxide for the purpose of detecting the possible presence of pseudomorphine, but none was found. The filtrate from the precipitate of manganese dioxide was of a light straw color. To it were added 30 Cc. more of a 1 per cent. solution of potassium permanganate in portions of 10 Cc. each, the solution being allowed to stand in each case until the purple color had disappeared, when the resulting precipitate of manganese dioxide was filtered off. Again 15 Cc. of a 1 per cent. solution of potassium permanganate were added in portions of 5 Cc. each, the solution being allowed to stand in each case until the purple color disappeared, the precipitate then being filtered off as in the previous experiments. Thus was a total of 295 Cc. of a 1 per cent. solution of potassium permanganate, equivalent to 2.95 grams of potassium permanganate added to 0.5 gram of morphine hydrochloride. Although the last portion of the potassium permanganate was decolorized, the reactio was sufficiently slow to indicate that the end reaction was not far off. The final filtrate was evaporated to dryness on a water bath, and the residue

* Ber. deut. chem. Ges. *13*, 91.

† Hesse, Ann. der Chem. *234*, 254.

found to be insoluble in all immiscible solvents, but soluble in water and about 40 per cent. alcohol. It was further found that a water solution of this residue would form a precipitate with solutions of the majority of the metallic salts, the alkalies being excepted. On account of repeated filtration to remove the bulky manganese dioxide formed after the addition of each portion of the permanganate, considerable of the reaction product was undoubtedly lost. If all the permanganate be added to the morphine solution at one time, one part of the alkaloid would probably decompose considerably more than six parts of the potassium permanganate.

III. To investigate further concerning the maximum quantity of potassium permanganate that could be decomposed by a given quantity of morphine, the following experiment was performed: To 3 grams of morphine hydrochloride dissolved in water were added, at one time, 20 grams of potassium permanganate dissolved in 500 Cc. of water, the temperature being kept close to 50° C. 40 minutes were required before the purple color of the permanganate was destroyed. The precipitate of manganese dioxide was removed as before. The filtrate and washings were concentrated to small volume, a solution of 4 additional grams of potassium permanganate added, and the mixture allowed to stand over night. By morning the purple color of the permanganate was found destroyed. The filtrate was concentrated on a water bath to five or six cubic centimeters, from which, upon cooling, a crystalline mass separated which was filtered and washed with alcohol. The filtrate, which was very dark brown and strongly alkaline, evolved much carbon dioxide upon acidifying. The crystals were found to be potassium oxalate, the potassium coming from the permanganate.

Considerable potassium carbonate was found in the dark mother liquor from which the oxalic acid was first obtained. The dark solution was acidified with hydrochloric acid, evaporated to dryness on a water bath, and heated in a drying oven for one hour at 100° C. The dry powder was extracted with alcohol until exhausted of coloring matter. The alcoholic solution in the flask became very dark brown. It was filtered to remove any potassium chloride which had crystallized out, and was then evaporated on a water-bath. A very dark brown, sticky residue was obtained which has not yet been investigated.

### SYSTEMATIC PROCEDURE WITH PERMANGANATE.

A series of experiments was next undertaken with a fixed amount of morphine, viz., one gram, and an increasing amount of potassium permanganate for the purpose of determining, if possible, the intermediate products of oxidation, and also the final products when a maximum amount of permanganate was used. In each experiment the solution of permanganate was of the same per cent. strength. The results obtained were tabulated as follows:

ONE GRAM OF MORPHINE HYDROCHLORIDE IS USED IN EACH EXPERIMENT.

| Amount of $KMnO_4$. | Time of reaction. | $MnO_2$ ppted. | Color of filtrate. | Reaction of filtrate. | Morphine found in filtrate. | Filtrate ppted. by Wagner's Reag. | Pseudo-morph. found in $MnO_2$ ppt. | Pseudo-morph. found in filtrate. | Nitrite test by $\alpha$-naphthylamine. | Nitrite test by starch-iodide. | Nitrate test by diphenylamine. | Ammonia found in filtrate. | Oxalate found in filtrate. | Carbonate found in filtrate. | Amount of water used. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 1. 0.5 Gm. | Instantaneous. | Yes. | Mahogany brown. | Slightly alkaline. | Slight test. | Small precipitate. | Large amount. | Very little. | Faint test. | Faint test. | None. | Slight test. | None. | None. | 25 Cc. |
| No. 2. 1.0 Gm. | " | " | " | " | " | A larger precipitate than from No. 1. | Less than found in No. 1. | More than found in No. 1. | " | " | " | " | " | " | 50 Cc. |
| No. 3. 2.0 Gm. | " | " | " | Alkaline. | " | Less than found in No. 2. | None. | Slight amount. | Good test. | Good test. | " | " | Small test. | " | 100 Cc. |
| No. 4. 3.0 Gm. | " | " | " | " | None. | Only a trace. | " | None. | " | " | " | " | Increasing amount. | " | 150 Cc. |
| No. 5. 4.0 Gm. | " | " | Lighter brown. | " | " | None. | " | " | " | " | Slight test. | Good test. | Good test. | " | 200 Cc. |
| No. 6. 5.0 Gm. | " | " | Light brown. | " | " | " | " | " | " | " | " | " | " | " | 250 Cc. |
| No. 7. 6.0 Gm. | Few minutes. | " | " | " | " | " | " | " | " | " | Good test. | " | " | " | 300 Cc. |
| No. 8. 7.0 Gm. | Seven hours. | " | " | " | " | " | " | " | " | " | " | " | " | Slight test. | 350 Cc. |
| No. 9. 8.0 Gm. | 25 hrs. | " | " | " | " | " | " | " | " | " | " | " | Fair test. | Good test. | 400 Cc. |
| No. 10. 9.0 Gm. | 6 days. | " | Very light brown. | " | " | " | " | " | " | " | " | Fair test. | No test. | " | 450 Cc. |
| No. 11. 10.0 Gm. | 4 weeks. | " | Almost colorless. | " | " | " | " | " | " | " | " | " | " | " | 500 Cc. |
| No. 12. 11.0 Gm. | 10 weeks. | " | Light purple. | — | — | — | — | — | — | — | — | — | — | — | 550 Cc. |

It may first be noticed from this table that the filtrates in experiments one to four were of the same shade of color—a mahogany brown. They gradually grew lighter from experiment five to eleven, the filtrate of eleven being nearly colorless. This fading of color was undoubtedly due, for the most part, to increased dilution, although it is possible that whatever caused the dark color was further oxidized by the permanganate to colorless products.

That the hydrochloric acid of the morphine hydrochloride neutralized only a small part of the potassium hydroxide formed in the reaction with the permanganate, is shown by the fact that the filtrate in the first experiment was slightly alkaline, the alkalinity gradually increasing with the use of increasing amounts of permanganate.

Upon extracting the alkaline filtrates with hot amyl alcohol, it was possible to obtain tests for morphine in the first three experiments. The presence of alkaloids was also indicated by the precipitates obtained in the first three experiments by the use of Wagner's reagent, a trace of a precipitate occurring in the filtrate of experiment four. While less morphine was to be expected in experiment two, on account of the increased amount of potassium permanganate used, the Wagner precipitate was larger than in experiment one. But, since pseudomorphine is known to occur in these reactions, and is rather soluble in an alkaline solution, the color tests obtained from the filtrate may be attributed to the pseudomorphine, it being difficult to distinguish between morphine and pseudomorphine * by means of color test, when the substances are used in small quantities.

The increased alkalinity of the solution in experiment two over that in experiment one, caused a larger amount of pseudomorphine to be dissolved in the filtrate of two than in that of one, a correspondingly less amount being found in the manganese dioxide precipitate. The fact that in number three no pseudomorphine was found in the precipitate of manganese dioxide, and only a slight amount in the filtrate by precipitation with Wagner's reagent, would indicate that the pseudomorphine was at that stage oxidized to other products. Since the alkalinity of the filtrate of three was stronger than that of two, pseudomorphine, if present in three in a quantity similar to that which appeared in experiment two, would have been found in the filtrate.

It is worthy of note that with the decrease in the amount of pseudomorphine in experiment three, oxalate first made its appearance. This might indicate that the phenanthren nucleus of the alkaloid was broken up directly into oxalic acid. In experiment four, where only a trace of alkaloid could be detected by Wagner's reagent, the amount of oxalic acid was found to have made a considerable increase.

A faint nitrite and ammonia test, appearing from the very first, seemed to indicate that the so-called morpholine ring was easily oxidized.

* Hesse, Ann. der Chem., *141*, 87; *176*, 195; *222*, 234; *234*, 255.

## ACTION OF IODIC ACID UPON MORPHINE.

The iodic acid test for the identification of morphine depends first upon the liberation of iodine from the iodic acid and secondly upon the formation of a brown color substance as an oxidation product, which becomes much darker when the solution is made alkaline with ammonia. In order to prepare a quantity of the color product of iodic acid oxidation of morphine under defined conditions, and make some determinations of the properties of such product, the following operations were carried out:

I. 300 Mg. of morphine hydrochloride dissolved in 10 Cc. of water were added to 150 Mg. of iodic acid dissolved in 20 Cc. of water.

II. 300 Mg. of morphine hydrochloride dissolved in 10 Cc. of water were added to 300 Mg. of iodic acid dissolved in 20 Cc. of water.

In each case the resulting mixtures were allowed to stand ten minutes, and were then shaken with an equal volume of fresh chloroform to remove the liberated iodine. It was necessary to shake out number one twenty-five times, and number two thirty-one times before all traces of iodine were removed. Number one was of a mahogany color while number two gave a much lighter shade of brown. After removing all the free iodine by means of chloroform, both solutions gave free iodine to chloroform when treated with concentrated nitric acid. 1 Cc. of each solution was evaporated to dryness on a water bath, with an excess of potassium hydroxide, and then heated in an oven for one hour at 185° C. Upon cooling, diluting with water and making acid with acetic acid, free iodine could be obtained by use of chlorine water or nitric acid. Upon adding hydrochloric acid, and a drop of potassium iodide solution to the iodine-free solutions of experiments one and two, a slight test for iodic acid was obtained from one, and a still better test from two. After standing two days, numbers one and two each gave free iodine when shaken with chloroform, the excess of iodic acid having continued to oxidize the organic compound. After standing ten days, number one gave no test for free iodine, the iodine formed at the end of two days' time having probably been taken up by the organic compound. No undecomposed morphine could be removed from either solution. Ammonia caused both solutions to become much darker, but they retained the same degree of difference in shade, number one being much darker than number two.

The iodine liberated in the reaction between morphine and iodic acid was removed by prolonged shaking with chloroform. With the purpose of also removing the excess of iodic acid, the reaction mixture was shaken with chloroform until all available iodine was removed. It was also treated with freshly-precipitated silver carbonate to remove the excess of iodic acid; but, after filtering, iodic acid could still be detected by treating the acidified solution with potassium ferrocyanide, and extracting the liberated iodine with chloroform. Freshly-precipitated silver oxide produced the same result. The clear solution which remained, after removing the silver

carbonate and oxide, was found to contain silver in solution, and upon warming, a trace of metallic silver separated as a mirror upon the side of the beaker. After evaporating the solution to dryness upon a water bath, a chocolate-brown powder was obtained which dissolved slowly in water, but became easily soluble upon the addition of a drop of ammonia, forming a very dark brown solution. This solution, slightly acidified with sulphuric acid, gave a heavy brown precipitate by use of Wagner's reagent. This precipitate was soluble in a solution of sodium thiosulphate, but after making alkaline with ammonia and extracting with immiscible solvents, nothing was obtained. A phosphomolybdic acid solution yielded a precipitate with a solution of this chocolate-brown powder; but the nitric acid of the reagent caused further oxidation, the blue color of the lower oxides of molybdenum being formed.

Experiments three, four and five were made in the hope of isolating the oxidation product by precipitating it with Wagner's reagent, picric acid or tannic acid, and obtaining the free product by the usual methods. This would obviate the necessity of previously removing the excess of iodic acid as well as that of the free iodine formed in the reaction.

III. Two grams of morphine alkaloid were dissolved in 200 Cc. of water by the aid of a slight excess of dilute sulphuric acid. This solution was poured into a 200 Cc. solution of 2 grams of iodic acid, and allowed to stand ten minutes. It was then poured into 500 Cc. of a one per cent. solution of iodine with a two per cent. solution of potassium iodide (Wagner's reagent), so as to make the highest periodide possible.* Upon shaking, a heavy, black viscid mass separated. This was washed by kneading it in running distilled water, and dried in a vacuum desiccator. It stil retained a strong odor of iodine, and was of a viscid consistency. This compound was soluble in alcohol, methyl alcohol, acetone and in dilute ammonia, somewhat soluble in acetic ether, glacial acetic acid and in 40 per cent. alcohol, insoluble in ether, benzene, chloroform, petroleum ether and in carbon disulphide. A crystalline product could not be obtained from a solution of this compound, either by long standing or by use of cold to —18° C. Nothing was extracted when a solution of this viscid mass was treated with sodium thiosulphate, ammonia and immiscible solvents. By pouring the iodine and potassium iodide solution into the reaction mixture of morphine and iodic acid, a lower periodide was formed which was granular and of a reddish-brown color. All attempts to recover a free base from this precipitate resulted in failure.

IV. 2½ grams of iodic acid dissolved in 300 Cc. of water were added to 5 grams of morphine hydrochloride, dissolved in 700 Cc. of water. The reaction mixture was allowed to stand about 20 hours, at the end of which time a small precipitate had settled to the bottom of the beaker, from which a small amount of morphine was obtained by treating with a

*A. B. Prescott and H. M. Gordin, Jour. Am. Chem. Soc., *20*, 708.

solution of sodium thiosulphate, ammonia and hot amyl alcohol. The clear solution was nearly neutralized with ammonia, and to it was added an excess of a water solution of picric acid. A heavy, flocculent, yellow precipitate separated which was filtered and washed with cold water. This precipitate was soluble in hot water and in alcohol, from which it again separated upon cooling, but not in a crystalline form. The washed, moist precipitate was mixed with dry potassium carbonate in excess, carefully dried at 100° C., and extracted with absolute alcohol until exhausted of color substance. The nearly black alcoholic extract was evaporated to a small volume, and precipitated by the addition of ether, the precipitate then being collected, washed and dried. A test for combined iodine was obtained from this residue by treating it with an excess of potassium hydroxide, evaporating to dryness, heating for 2 hours in an air oven at 185° C., cooling, acidifying with acetic acid, and liberating the iodine with chlorine water or concentrated nitric acid. An attempt to isolate the color compound by mixing the picrate precipitate with freshly precipitated lead carbonate, drying and extracting the alcohol, gave negative results.

V. 5 grams of morphine hydrochloride dissolved in 250 Cc. of water were poured into a solution of 5 grams of iodic acid in 250 Cc. of water. The mixture soon became cloudy, and, after being allowed to stand 3 hours, was filtered, the small residue obtained giving a test for morphine. The solution was made slightly alkaline with ammonia to take up all the free iodine, then slightly acid with dilute sulphuric acid, and precipitated with a solution of tannic acid. The bulky precipitate was washed, mixed with freshly precipitated lead carbonate, dried, and extracted with alcohol for several days in a Soxhlet apparatus. Upon concentrating the alcoholic extract only about 100 Mg. from the 5 grams of morphine was obtained. This small residue contained iodine in combination. The tannic acid did not cause complete precipitation of the unknown substance in the original solution. Wagner's reagent, added to the filtrate, caused a bulky precipitate to form, but no morphine could be obtained from either filtrate or precipitate. It appears that the little alkaloid left unchanged in the original mixture of iodic acid and morphine was immediately precipitated by the iodine formed in the reaction, and then filtered; the solution contained nothing but the oxidation product of morphine, free iodine and some excess of iodic acid.

In experiments VI, VII, VIII and IX, which follow, it was attempted to remove the liberated iodine and excess of iodic acid, in a single operation by precipitation with a solution of a suitable silver salt, and so obtain the oxidation product free at least from these two impurities.

VI. A solution of 1 gram of morphine hydrochloride in 300 Cc. of water was added to a solution of 1 gram of iodic acid in 200 Cc. of water, and allowed to stand 10 minutes, when a solution of silver sulphate was added in excess to take up all iodine liberated and the excess of iodic acid.

Hydrogen sulphide gas was now passed into the filtrate until all silver was precipitated. The filtrate was heated to remove hydrogen sulphide, and while hot treated with an excess of barium carbonate to remove sulphuric acid obtained from the silver sulphate. Upon filtering, a very dark, neutral solution was obtained. Sulphuric acid, added to a portion of this solution, gave a precipitate of barium sulphate, but ammonium carbonate or oxalate caused no precipitation. The dark solution was carefully evaporated to a brown scaly residue, soluble in water and dilute alcohol, but insoluble in strong alcohol and immiscible solvents. A crystalline product could not be obtained from this residue. A quantitative determination of the barium gave 12.2847 per cent.

VII. A solution of 1 gram of morphine hydrochloride dissolved in 300 Cc. of water was added to a solution of 0.5 gram of iodic acid dissolved in 200 Cc. of water. This mixture was allowed to stand 12 hours, when an excess of a solution of silver sulphate was added to remove all iodine and iodic acid. The excess of silver was removed by hydrogen sulphide, and barium carbonate was added as in experiment VI. Upon estimating the barium 9.336 per cent. was obtained.

VIII. A solution of 1 gram of morphine hydrochloride dissolved in 300 Cc. of water was added to a solution of 0.6 gram of iodic acid dissolved in 200 Cc. of water. The reaction mixture was allowed to stand five minutes, when an excess of silver sulphate was added, and a barium compound obtained, the amount of barium in this case being 5.897 per cent. A water solution of this barium compound gave nothing to immiscible solvents in neutral, alkaline or acid mixtures. A solution of the dark product was quickly oxidized by potassium permanganate. Upon removing the precipitate of manganese dioxide, the filtrate, which was nearly colorless, was found to contain a trace of oxalates. The barium compound gave a test for nitrogen and combined iodine.

IX. A solution of three grams of morphine hydrochloride in 200 Cc. of water was added to a solution of two grams of iodic acid in 200 Cc. of water, and allowed to stand fifteen minutes. To this was added a solution of silver acetate in slight excess to remove iodine and iodic acid. Excess of silver was removed as before. The amber-brown filtrate was concentrated to about 400 Cc. Ferric chloride caused this solution to become very dark. When a drop of the ferric chloride was added to a drop of this solution upon a white plate, the result was a violet to blue-black coloration, much deeper and different from that obtained when ferric chloride is added to a solution of morphine. A slight precipitate was obtained by bromine water. Although the action of the compound with these two reagents indicated a phenolic character, no other tests for phenols were obtained. The solution was next evaporated to dryness on a water bath, when a chocolate-brown powder was obtained, soluble in water, the solution becoming darker upon the addition of ammonia, also soluble in dilute

alcohol, but insoluble in other ordinary solvents. This residue was carefully dried in a vacuum desiccator over soda lime to remove any acetic acid, but a water solution of the product was still acid toward litmus. This compound was found to contain iodine. An alcoholic solution of the residue reduced an alcoholic solution of silver nitrate with the formation of a mirror of metallic silver. The powder contained no silver; but, upon warming a water solution of this residue with freshly-precipitated silver oxide, cooling and filtering, the solution was found to be darker and to contain silver. Attempts were made to introduce an alkyl group into the silver and barium compounds in place of the metal, and so possibly obtain a crystalline compound, but without results.

Upon burning this residue, 0.5 per cent. of ash was obtained. The residue began to decompose at about 115° C., yielding a brown sublimate which did not contain iodine. No two compounds have yet been obtained which show the same per cent. of iodine. A water solution acidified with hydrochloric acid was completely precipitated by a solution of platinum chloride, mercuric chloride and other alkaloidal precipitants. These precipitates were, as a rule, very insoluble, and all attempts to obtain them in a crystalline form resulted in failure.

It seems probable from the preceding experiments that iodine enters into combination with the product obtained by the oxidation of morphine with iodic acid. It has also been found that metals, such as the alkalies and barium, unite with this oxidation product, forming compounds of a darker color than the free product. The oxidation at first proceeds very rapidly, but gradually becomes slower. The iodine first liberated can all be removed by the use of chloroform, but more iodine is formed upon standing, showing that the process of oxidation is still taking place. This reaction proceeds for several days. The iodine is probably further reduced to hydriodic acid, which in turn unites with the iodic acid present to form more free iodine, thus complicating the reaction. The hydriodic acid and iodine formed precipitates any morphine that has been oxidized. This precipitation, which is slight, takes place usually within one minute after mixing the morphine with the iodic acid. When the reacting solutions are very dilute, no precipitation occurs. If a 5 gram sample of morphine reacts with an equal amount of iodic acid, only a few milligrams of the unchanged alkaloid can be recovered from the precipitate, and none from the clear filtrate, showing that nearly all the morphine is quickly oxidized, the continued slow oxidation being probably a reaction between the iodic acid and the first products of oxidation.

It is found, as observed by Pelletier in 1836, that the liberated iodine is gradually absorbed by the organic compound. Solutions of silver salts will not remove all of the iodine from this compound, it being necessary, in estimating, to heat it in a sealed tube with silver nitrate and fuming nitric acid.

An analysis of the product obtained in the oxidation of morphine with iodic acid indicates that it is not in a pure form, probably being a mixture of two or more oxidation products, the properties of which are very similar. The reactions of this compound with the various alkaloidal precipitants would indicate that it still retains properties of an alkaloid, although differing somewhat from those of morphine, as insolubility and in not being able to be obtained in crystalline form. The acidic properties, however, are more pronounced than in morphine, compounds being readily formed with the alkalies and alkaline earths.

It is probable that in this case pseudomorphine is again the first product of oxidation, as was found in the use of potassium permanganate, but owing to the similarity between the properties of morphine and pseudomorphine, and the liberation of iodine which complicates the results, this stage of oxidation has not been determined with certainty.

In regard to the action of iodic acid upon morphine as an analytical test, it is evident that the test becomes less delicate the larger the excess of iodic acid used, the color being much darker, both before and after adding ammonia, when one part of iodic acid reacts with two parts of morphine than when equal parts or more of iodic acid react with morphine.

In conclusion sincere thanks are expressed to Prof. A. B. Prescott, in whose laboratory and under whose direction the work has been done.

*Chemical Laboratory of the University of Michigan, Ann Arbor, Mich.*

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## RESIN OF PODOPHYLLUM U. S. P., OR PODOPHYLLIN.

BY HERMAN J. LOHMANN, JERSEY CITY, N. J.

Notwithstanding the fact that a number of papers have been written on the subject of Podophyllum and the resin obtained therefrom, I will offer a few remarks on this subject. Apparently all the papers heretofore considered the true U. S. P. preparation.

In the first place, I would like to state that the term Podophyllin is a misnomer, the substance not being a glucoside nor an alkaloid, nor a neutral principle, but a true resinous compound. This being the case, the term Podophyllin should be eliminated from the U. S. Pharmacopœia.

I would like to refer to the paper on that subject read before the New Jersey Pharmaceutical Association at Lakewood in 1896. As you will note, the Resin of Podophyllum, U. S. P., is made by adding an evaporated liquid extraction of the root to water acidulated with HCl. If these instructions are carried out, then the result will not comply with the U. S. P. description of the substance, but instead of being of a yellowish-green or greenish yellow color it will be of a light brown color.

The greenish-yellow substance of the U. S. P. description, which is so commonly found in our pharmacies, does not respond to the U. S. P. tests.

This substance, as prepared by the U. S. P. process, is of a brown light color, and turns darker on exposure to the atmosphere even at the ordinary temperature, especially if the atmosphere be moist.

I have prepared the resin by three different processes, viz.:

Process I. By addition of water only.
II. By addition of water acidulated with HCl.
III. By addition of water acidulated with HCl and containing 5 per cent. Alumen, U. S. P.

The first process yielded a nearly white resinous substance, the second a light-brown, and the third a greenish-yellow substance.

Again the various processes yielded varying amounts of precipitate. Thirty Cc. yielded—

| Process. | 1st time. | 2d time. |
|---|---|---|
| I. | 1.23 Gm. | .95 Gm. |
| II. | 2.98 " | 2.13 " |
| III. | 4.53 " | 4.3 " |

These two fluid extractions were of the same strength and were made with the same amount of care, but of different samples,and the differences in the results have led to further investigations. The same differences will be produced by applying fluid extracts as prepared in our various pharmaceutical laboratories. Tests applied to fluid extracts from some of these laboratories show a difference of 1.2 between the highest and the lowest amount of the resin present in 30 Cc.

Before proceeding I would like to state that my investigations on this subject cover a period of a number of years.

*Root collected in the spring before blossoming and seasoned two years* gives the best results as to amount of precipitate. Thirty grammes of the root collected and seasoned as mentioned yielded—

| | |
|---|---|
| Process I | 1.28 Gm. |
| II | 3.1 " |
| III | 5.79 " |

Judging from the fact that the drug of the market is a mixture of collections covering the entire year, and is most likely unseasoned, the percentage yield does not equal that as produced from the drug collected before blossoming.

The dose, as is to be expected, varies according to the process applied in the manufacture. In one instance, one one-hundred-and-fiftieth grain by process I, having been given to a youth sixteen years of age, produced violent pains in the intestines, and convulsions. Product of II can be given in doses of one-quarter to one-half grain, while that by process III can be given in doses of one to two grains.

### SOLUBILITY IN ALCOHOL AND ETHER.

As it is a known fact that a substance must go into solution in the liquid from which it was precipitated, unless a chemical reaction has taken place, so it will be unmistakably understood that the Resin Podophyllum as produced from 30 Cc. of the fluid extract by processes I and II will dissolve in the same volume of alcohol or ether. This, however, cannot be said about the product by process number three, which will leave a deposit upon double the amount of solvent being applied. Filtering the fluid, collecting and washing the precipitate with alcohol or ether until all coloring matter is removed, and treating the precipitate with boiling water, a solution will be produced. This indicates the presence of inorganic matter, and upon the addition of $NH_4HO$ a gelatinous white precipitate, which is insoluble in an excess of $NH_4HO$ will be produced. This shows aluminum present.

We now turn to the U. S. P. test:

Process I. Soluble in alcohol and ether in all proportions.
Process II. Soluble in alcohol and ether in all proportions.
Process III. Soluble in alcohol and ether up to eighty-five per cent.; white residue.

Process I. Boiling water fuses nearly completely; precipitates on cooling.
Process II. Boiling water fuses nearly completely; precipitates on cooling.
Process III. Boiling water fuses nearly completely; and on cooling lost fifteen per cent. in precipitate.

Processes I and II. Completely soluble in Sol. KHO or NaHO, and re-precipitates from the liquid with acid, leaving a varyingly brown colored liquid.
Process III. Not completely soluble in KHO or NaHO, leaving gelatinous residue, and is re-precipitated from the liquid with acid in a brown color, and produces a yellow liquid.

RESUMÉ.

Inasmuch as Resin of Podophyllum is not found in the fresh drug, and developing apparently by reaction among the constituents of the drug during seasoning of two years, and that the drug collected before blossoming produces the greatest yield, it would be well for the U. S. P. to specify these conditions in connection with Podophyllum.

Furthermore, that the yellowish-green or greenish-yellow Resin of Podophyllum does not comply with the tests prescribed, and the light-brown resin does comply with the tests; that the descriptive terms, "yellowish-green or greenish-yellow," be eliminated from the U. S. P.

It is only fair to state that an aluminum salt is a part of the resin which offers resistance to the solvents. Beware of yellow Resin of Podophyllum.

## USES OF CARBON TETRACHLORIDE.

BY OTTO RAUBENHEIMER, PH. G.

In previous papers published, Pharm. Era, vol. xxix, No. 17, April 23, 1903; No. 20, May 14, 1903, and No. 29, June 18, 1903, I have given a full description of synonyms, formula, discovery, preparation, impurities, purification and properties of carbon tetrachloride. The price has been greatly reduced by the manufacturers in Germany. It is now produced chemically pure, free from $CS_2$ or $H_2S$, and will no doubt come into universal use.

### I. TECHNICAL USES.

1. As a solvent it dissolves fixed and volatile oils, fats, wax, ceresin, spermaceti, paraffin, stearin, vaseline, pitch, resins, balsams, etc.

2. For extracting fats and oils from wool, cotton, seeds, leather, hides, hair and numerous other animal and vegetable products.

3. As a cleaning fluid for type, lithographers' stones, printers' rollers, etc., rubber stamps, typewriting machines, mirrors and glassware, oil paint-

ings, sewing machines and other machinery, clock and watch works, nickel, bronze, brass, silver, gold, diamonds.

4. For removing spots from wool and cotton goods, velvet, satin, silk, laces, ribbons, kid gloves and shoes, leather goods, felt hats and sweat bands, carpets and rugs, etc.

[For above uses, carbon tetrachloride is to replace benzin, naphtha and gasoline, carbon disulphide and benzene (benzol), it being absolutely non-inflammable and non-explosive, and therefore entirely safe to use near fire or flame.]

5. For fire-proofing paints, mixing and dissolving paint, asphaltum, varnish, shellac, etc.

6. For fire-proofing cleaning fluids, as fully described in another paper: "Non-inflammable Benzin or Safety Benzin."

7. As a fire extinguisher, about half a pint poured over a small fire in the stove will extinguish same. I recommend to put it up in bottles of thin glass so that they will break easily, and put in convenient places for use in emergency.

8. In place of chloroform for extracting various alkaloids, etc.

### II. MEDICINAL USES.

1. As an anæsthetic it has been abandoned, but it would be worth while to take the matter up again, as very likely at that time $CCl_4$ was not produced in the purest state.

2. In place of chloroform, for killing disabled or sick dogs, cats, birds, etc.

3. As an insecticide for roaches, bedbugs and other vermin, also for weevil in grain or seeds.

### ADVANTAGES OF CARBON TETRACHLORIDE.

a. As already stated, it is non-inflammable and non-explosive, and therefore entirely safe.

b. It evaporates entirely, and does not leave any odor in the material to be extracted, like benzin, benzol or carbon disulphide do.

c. Carbon tetrachloride is a definite chemical combination of 1 atom carbon and 4 atoms chlorine, but benzin consists of various hydrocarbons, chiefly of the marsh-gas series, $C_5H_{12}$, $C_6H_{14}$, and homologous compounds. If for extracting purposes, we use benzin, and then distill the benzin off (in order to use it over again), we will find that, in the course of time, the very lightest hydrocarbons will be lost and the heavier ones will remain; that is, the sp. gr. will be heavier and the boiling-point of our benzin will be higher. On the other hand, $CCl_4$ will remain unaltered, sp. gr. 1.6; B. P. 77° C. will stay the same.

d. It is considerably cheaper than chloroform and in most respects behaves exactly the same.

Carbon tetrachloride is at present not manufactured in the United States, but imported from Germany and France. No doubt it will gradually come into general use, after its advantages are known, and then the chemical factories will make it here, especially as carbon disulphide is produced now by means of the electric furnace.

## CONTRIBUTION TO THE CHEMISTRY OF CHELIDONINE.

J. O. SCHLOTTERBECK AND H. C. WATKINS.

In a previous paper we had demonstrated the existence of six distinct alkaloids in the plant *Stylophorum diphyllum*, of which chelidonine is the most abundant present. The work done at that time included the verification of the formula ascribed to it by Henschke and Schmidt and Selle, determination of molecular weight, optical rotation, and the fact that it is a tertiary base. The investigations carried on by us since that time were for the purpose of ascertaining, as far as possible, the constitution of this base.

Chelidonine possesses the formula $C_{20}H_{19}NO_5.H_2O$, has a melting point of 136° C. and rotates $[a]^D = +115° 24'$.

To determine whether or not chelidonine contains hydroxyl groups in its molecule, the preparation of an acetyl compound was attempted. To the freshly-precipitated free alkaloid four times its weight of acetic anhydride was added and immediately placed upon the steam bath for the purpose of removing the excess by evaporation. There remained a brownish, varnish like mass which was dissolved in boiling alcohol, filtered and set aside. In a short time an acetyl compound separated in the form of beautiful white plates, which melted at 161° C. As this compound is insoluble in cold alcohol, crystallization is very rapid and complete from a cooling hot alcoholic solution.

The determination of the number of acetyl groups in this derivative was effected as follows:

A proper amount of phosphoric acid was placed in a flask connected with a condenser and a steam generator and steam passed through the acid until the distillate gave no test for acid. Then 0.3108 Gm. of the pure acetyl compound was placed in the flask containing the phosphoric acid and steam passed through the liquid until no more acetic acid came over. It required 37.4 Cc. of $\frac{N}{10}$ KOH to neutralize the total acetic acid distilled over. This is the equivalent of 10.65 per cent. of $C_2H_3O$. One acetyl group constitutes 10.88 per cent. of the compound.

To verify the presence of one hydroxyl group, a benzoyl compound was also prepared. A weighed portion of pure chelidonine was heated on the steam bath for one-half hour with twice its weight of benzoic anhydride. The yellow molten mass was dissolved in chloroform, then alcohol added and set aside for some time. On cooling, a white crystalline powder separated which melted at 217° C. and from the filtrate crystals were obtained

which melted at 121° C. The latter were benzoic acid arising from the excess of benzoic anhydride.

The number of benzoyl groups present in the compound were determined indirectly by ascertaining the per cent. of nitrogen present by means of the Kjeldahl method. Using 0.240 Gm. of the pure benzoyl compound 5.55 Cc. of $\frac{N}{10}$ HCl were necessary to neutralize the ammonia produced which equals 3.1 per cent. N. The calculated amount for $C_{20}H_{18}(C_7H_6O)NO_4$ is 3.07 per cent. Hence chelidonine has but one hydroxyl group and the formula can be written $C_{20}H_{18}(OH)NO_4.H_2O$.

In our previous investigation we had proved the absence of methoxyl groups.

The reducing action of zinc dust was tried by boiling a quantity of the pure alkaloid with zinc dust and glacial acetic acid for six hours at 100° C. The cooled mixture was filtered, precipitated with ammonia and shaken out with ether, but nearly the entire amount of chelidonine taken was recovered. It is possible that if this treatment be continued for many days some decided action may be noticed. This will be taken up at some later time.

Chelidonine and KOH in about equal quantities were thoroughly mixed and heated to fusion in a nickel crucible over a small flame. The molten mass formed two layers at first, the alkaloid apparently being the upper one. As the heat was raised, a homogeneous mixture was formed and gases having the odor of ammonia and amines were given off. The heat was then removed and water added to the fused mass. The mixture was filtered and the undissolved portion treated with acetic acid to dissolve, then with ammonia to precipitate and then shaken with ether. From the ether solution chelidonine separated showing that oxidation was not complete. The filtrate was neutralized with $H_2SO_4$ which produced a brown gelatinous precipitate while the filtrate was brownish-red. A part of the precipitate was soluble in boiling alcohol but after concentrating and setting aside for many weeks no crystals separated. The filtrate from the first precipitate was treated for oxalic acid but none was found. Part of the first filtrate was set aside for weeks but no crystals were formed in this case either. It is quite probable that oxidation was so complete that $NH_3$, $CO_2$ and $CH_3NH_2$ alone and no intermediate products were produced.

About 10 Gm. of chelidonine were triturated with about ten times its weight of zinc dust and placed in a combustion tube, one end of which was connected with a hydrogen generator and the other with a train of three wash bottles. The first bottle was empty but surrounded by a freezing mixture, the second contained water, and the third dilute HCl. After the air was expelled from the tube by dry hydrogen, heat was cautiously applied at the back end of the tube and then gradually raised and advanced until the whole tube was a dull red. White fumes of $NH_4Cl$

escaped from the last bottle throughout the entire process. At the end of the operation the apparatus was disconnected and a reddish, varnish-like distillate, which had condensed at the end of the tube, dissolved out with chloroform. After standing until the chloroform had evaporated, small wart-like crystals remained. The quantity was too small for a melting-point determination. They possessed a phenathrene-like odor, but it was impossible to form a condensation product with a-dinitro-phenanthrene-quinone and nitro-benzene.

In the first bottle of the train there had condensed some water upon which a few drops of oil floated. The oily matter was dissolved in ether and set aside, but without result. The contents of the second bottle gave a very decided test for $CO_2$. The water from bottles 1 and 2 were mixed with the contents of bottle 3 and an excess of platinum chloride added. This was then placed upon the steam bath and evaporated until crystals began to appear. The yellowish-red octahedral crystals were separated and the per cent. of platinum determined by incineration. 0.1376 Gm. of the compound gave .0602 Gm. of Pt. or 43.7 per cent. Calculated for $(NH_4Cl)_2PtCl_4$ the amount of platinum is 43.93 per cent.

As products of this operation we may again look for $NH_3$, $CO_2$ and probably $CH_3NH_2$, since the contents of all the bottles of the train possessed a strong amine-like odor.

To test the presence of aldehyde groups in this base a quantity of free chelidonine in alcoholic solution was treated with four times its weight of hydroxylamine hydrochloride and potassium hydroxide in equimolecular parts. This was heated for several hours on the water-bath. White crystals were readily formed but they proved to be KCl and chelidonine hydrochloride.

Another portion of the alkaloid was treated in the same manner, but with an excess of KOH. As before, the free alkaloid was recovered at the end of the operation, showing no action whatever.

The action of phenylhydrazine was next tried by taking 1 part of alkaloid and 1 part of phenylhydrazine hydrochloride and 1.5 parts sodium acetate in dilute acetic acid solution, and heating for some time upon the steam-bath, but no action took place. Later the free alkaloid and free phenylhydrazine were heated together in alcoholic solution, but with no better result.

The experiments so far show that there are no aldehyde or ketone groups, nor methoxyl groups. Attempts to oxidize the alkaloid with the usual oxidizing agents have resulted either in oxidizing the molecule completely or not at all. So far we have not been successful in accomplishing an intermediate oxidation, but we shall take up the subject again along different lines.

*School of Pharmacy, University of Michigan, Ann Arbor, Mich.*

## CHEMICAL AND PHYSICAL CONSTANTS OF OIL OF DATURA STRAMONIUM.

JULIAN W. BAIRD, A. M., PH. C., M. D., AND FLORA F. SLEEPER, PH. C.

This paper is a report of the work done upon oil extracted from the seeds of Datura Stramonium, with a special view to obtaining what are commonly known as the physical and chemical constants of this oil.

The whole seeds of Datura Stramonium were used, and ground to a No. 60 powder. "Gasoline of 76 degrees," which had previously been purified with sulphuric acid and caustic soda, was employed in extracting the oil. The ground stramonium seeds were packed in a cylindrical glass percolator and the oil obtained by percolation with the gasoline in the cold. After percolation, the gasoline was allowed to evaporate in the air, and the last traces were removed by gentle heat. Then the oil was filtered to remove any traces of sediment.

By this method of extraction, 1,268 cubic centimeters of oil was obtained from 10 pounds of the seeds, or 1166.43 grams, or a yield of 32 per cent.

The oil was limpid, of a light yellow color, slightly tinged with green, and had a peculiar odor, which is an important characteristic, and a slightly acrid taste.

Nearly all the tests were done according to the methods given by the Association of Official Agricultural Chemists.

The tests were done in duplicate, and blank tests made in all cases.

The gravity was taken with a pycnometer, at 15° C., in comparison with water at 15° C., and the specific gravity thus obtained was 0.9199.

The gravity obtained with a 50 Cc. specific gravity flask, with a capillary ground glass stopper, at 100° C., in comparison with water at the same temperature, was 0.8988.

The viscosity of the oil, determined by use of Saybolt's Viscosimeter, with 66 Cc. of oil at a temperature of 64° F., was such that 157 seconds, or 2 minutes 37 seconds, were required for the oil to pass through the aperture.

The iodine value, or the percentage of iodine absorbed by a definite amount of the oil was determined by Hübl's method. The oil absorbed 109.03 per cent. of iodine, or the iodine number of stramonium oil.

The saponification value, or Kœttstorfer number, is the number of milligrams of potassium hydroxide neutralized in saponifying one gram of oil; a measure of the saturating power of the total fat acids. The saponification value of this oil was 194.02.

The saponification equivalent, or number of grams of fat saponified by one equivalent of potassium hydroxide, or 56.1 grams, is obtained by dividing 56,100 by the saponification, or Kœttstorfer number. $56100 \div 194.2 = 288.8$, or the saponification equivalent of the oil.

The neutral alcohol used to test for free fatty acids was obtained by heating 95 per cent. alcohol with caustic potash for two days on a steam bath with reflux condenser, then distilling, and using the distillate as soon as obtained.

The acid value of the oil, or the number of milligrams of potassium hydroxide required to saturate the free acids in one gram of the oil was 3.307 Mgms. KOH.

The result may be expressed as acid degree, the number of cubic centimeters of normal alkali required to neutralize the free acids in 100 grams of oil. The acid degree is 5.916.

As each cubic centimeter decinormal alkali used for neutralization is equivalent to 0.0282 grams oleic acid, $5.916 \times 0.0282 = 0.16683$ Gm. oleic acid in 10 Gm. oil, or 1.67 per cent. free oleic acid.

The Reichert process was used for the determination of the amount of volatile acids, but five grams of oil were taken, as suggested by E. Meissl, which gives the number so obtained the name of Reichert–Meissl number. For saponification in this determination the solution devised by Leffmann and Beam, namely, sodium hydroxide in glycerol, was used. 0.68 Cc. $\frac{N}{10}$ KOH were required to neutralize the volatile acids in five grams of the oil, therefore 0.68 is the Reichert–Meissl number of the oil. Dividing this result by 2 gives the Reichert number, 0.34.

The soluble acids (or proportion of acids soluble in water) were separated from the insoluble acids, and the number of milligrams of potassium hydroxide required to neutralize the soluble acids from one gram of oil determined. 4.614 Mgms. KOH were required.

The proportion of acids insoluble in water is often called the Hehner value. The insoluble acids obtained from five grams of oil by separation from the soluble acids were dried in a water-oven at 100° C. to constant weight, and from this weight the percentage of insoluble acids in the oil was calculated, and the result obtained was 93 per cent. The insoluble acids thus obtained were of a bright yellow color, showing none of the greenish tinge which characterizes the oil.

The saponification value of the insoluble acids was determined by the method employed with the oil. 210.94 milligrams potassium hydroxide were required to saponify one gram of the insoluble acids obtained from stramonium oil, or the saponification value.

The melting and congealing points of the insoluble acids were determined by means of a capillary tube by chilling in ice water. The congealing point was 23.1° C., and the melting point was 25.1° C.

The iodine number of the insoluble acids of the oil was determined by the same method as for the oil, and was 71.19 per cent.

The method used to determine the per cent. of liquid acids was Muter's method modified by Lane. The oil contains 74 per cent. of oleic acid, or liquid acids.

The iodine number, or percentage of iodine absorbed by the liquid acids, determined by Hübl's method, was 127.87 per cent.

The acetyl value, or acetyl number, is the number of milligrams of potassium hydroxide required for neutralizing the acetic acid obtained from one gram of the acetylated oil.

The acetyl value was introduced by Benedikt into the analysis of fats as a chemical constant, and furnishes a measure of the proportion of hydroxylated fatty acids in fatty oils or fats. He proposed to work on the fatty acids, but the process was modified by Lewkowitsch, who worked on the oils or fats directly, which gives more exactly the true content of hydroxy acids.

The oil was first acetylated, then used for the determination of the acetyl value. The acetylated oil had a distinct light green color, and only showed a trace of yellow color, which is the reverse of the coloring of the original oil. 23.5 Mgms. potassium hydroxide were required for neutralizing the acid obtained from one gram of the acetylated oil, or the acetyl value.

The saponification value of the acetylated oil was determined and calculated in the same manner as for the natural oil. 197.25 Mgms. potassium hydroxide were required to saponify one gram of acetylated oil, or its saponification value.

The determination of the presence or absence of phytosterol and cholesterol was made upon fifty grams of oil. The weight of residue obtained from the ethereal solution evaporated to dryness was 0.089 Gm., or 0.178 Gm. to every 100 Gm. of the oil. Microscopic examination of the crystals obtained from the hot alcoholic solution showed star or bunch-like groups of needle-shaped crystals, denoting the presence of phytosterol. No plate crystals were found, and therefore cholesterol was absent.

The oil was found to contain 2.17 per cent. of unsaponifiable matter, making, by difference, 97.83 per cent. of saponifiable matter.

The solidifying point of the oil was as follows: When cooled to −2° C., the oil began to gelatinize; at −15° C. it became very viscous and thick; and at −19° C. it was so solid that it would not run on inverting and shaking the container, and it looked like a thick, whitish jelly.

Valenta's test determines the solubility of oils or fats in acetic acid, or their turbidity temperature in acetic acid in degrees. By this test with stramonium oil, the change from brilliancy to turbidity took place at 79° C.

In the determination of the Maumené number, or thermal reaction with sulphuric acid, or the degrees of rise in temperature, the temperature at the beginning of the test was 23° C., and at the conclusion it was 97° C. Therefore the rise of temperature was 74° C, or the Maumené number of the oil.

A comparison test, made with an equal volume of water and 10 Cc. sul-

phuric acid, under the same conditions as were used with the oil, gave a rise of temperature of 43° C.

The specific temperature reaction of stramonium oil, as obtained by dividing the rise of temperature with the oil, namely, 74°, by the rise of temperature with water, namely, 43°, and multiplying that result by 100, is 171.

By applying the claidin test to the oil, at the end of two hours a cream-colored mass, of the consistency of butter, separated from a fluid portion, the fluid portion being largely in excess. The fluid portion was dark yellowish-brown in color, and considerably thicker than the original oil.

Two drops of strong sulphuric acid were placed in the center of about twenty drops of oil, and allowed to rest a few minutes, when it became an orange color, and solid. Then the mixture was stirred, the color deepened to a reddish-brown, and the mass remained solid.

For Bach's color test, 5 Cc. of oil was agitated with 5 Cc. of nitric acid of gravity 1.30. The color became old rose, and it remained liquid. Then the mixture was immersed in boiling water for five minutes, and it became light yellow and thick. On standing twelve hours, no further change took place in the mixture.

By Massie's color test with nitric acid, the color of the oil was changed to a rosy orange hue.

As a test for the drying property of the oil, when the oil alone was exposed in a thin layer on a watch-glass to room temperature for forty-four days, no change was noted. After heating the oil in a thin layer on a watch-glass at a temperature of 50° C. for thirty hours, no appreciable amount of oxidation or drying had taken place, no skin formed, and the oil was only a little thicker than before heating. When heated in a thin layer at 100° C. for 24 hours, the oil dried to a firm skin of the consistency of a varnish.

As the drying of oils is hastened by mixing with finely divided lead, 0.7 Gm. of the oil was mixed with 1 gram of dried lead on a tared watch-glass, and allowed to stand at room temperature, and its increase in weight noted from time to time. This process was used by Livache, and so is known as Livache's test. No gain in weight was noted during the first three days by this method. After five days the oil had gained 0.017 Gm., or an increase of 2.4 per cent. After seven days the oil had gained 0.0196 Gm., or an increase of 2.8 per cent. After eleven days the oil had gained 0.025 Gm., which was its maximum increase in weight, or a total gain in weight of 3.57 per cent. The oil dried to a firm, tough skin.

TABLE OF RESULTS.

Yield of oil obtained from seed, 32 per cent.
Sp. gr. at 15° C. (compared with water at 15° C.), 0.9199.
Sp. gr. at 100° C. (compared with water at 100° C.), 0.8988.
Viscosity (66 Cc. oil at 64° F. required to pass aperture), 157 seconds.
Iodine number (Hübl), 109.1.

Koettstorfer number, 194.02.
Saponification equivalent, 288.8.
Acid number, or acid value, 3.307.
Reichert-Meissl number, 0.68.
Soluble acids, from 1 Gm. oil, equivalent to 4.614 Mgms. KOH.
Hehner value, or insoluble acid, 93 per cent.
Saponification value of insoluble acids, 210.94.
Melting point of insoluble acids, 25.1° C.
Congealing point of insoluble acids, 23.1° C.
Iodine number of insoluble acids, 71.19.
Liquid acids, 74 per cent.
Iodine number of liquid acids, 127.87.
Acetyl value of oil, 23.5.
Saponification value of acetylated oil, 197.25.
Phytosterol, present.
Cholesterol, absent.
Unsaponifiable residue, 2.17 per cent.
Proportion of saponifiable matter, 97.83 per cent.
Solidifying point—
Began to gelatinize at —2° C.
Very viscous at —15° C.
Completely solidified at —19° C.
Turbidity temperature in acetic acid, 79° C.
Maumené number, or thermal reaction with $H_2SO_4$, 74.
Specific temperature reaction, 171.
Elaidin test, buttery mass and fluid portion.
Color test with $H_2SO_4$, { before stirring, orange, solid. / after stirring, reddish-brown, solid.
Bach's color test (with $HNO_3$), { after agitation, old rose, liquid. / after heating, light yellow, thick.
Massie's color test (with $HNO_3$), rose-orange.
Drying property, oil alone—
Exposed to air at room temperature, no change in 44 days.
Heated at 50° C. for 30 hours, no change.
Heated at 100° C. for 24 hours, dried to varnish.
By Livache's test, { maximum increase in weight, 0.025 Gm. / maximum increase per cent., 3.57. / time for maximum increase, 11 days.

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Color tests, Leff. & Beam's Food Anal., p. 141.
Drying property, Livache's test, Leff. & Beam's Food Anal., p. 158.

*Analytical Laboratory, Massachusetts College of Pharmacy, Boston, Mass.*

## ROSE GERANIUM OIL AND ITS SUBSTITUTES.

BY LYMAN F. KEBLER, CHIEF OF DRUG LABORATORY.

[Contribution from Bureau of Chemistry, U. S. Department of Agriculture, No. 2.]

In spite of the great advancement made in the chemistry of essential oils, during the past decade, ample evidence can readily be collected to show that this is as yet a fertile field for the adulterator. The manipulations are practiced from the tyro who endeavors to palm off oil of French turpentine for oil of rue, and the distiller who sprinkles his rose leaves with geranium oil before distilling, to the chemist who is an abettor to the use of acetin and glycerin in volatile oils for the purpose of increasing the apparent content of ester and alcohol, respectively.

By referring to the various price lists it will be found that the quotations for the geranium oils vary from $12 per pound for the Spanish to $2.25 for the Turkish oil; and ginger-grass oil, which is conceded to be only another name for an inferior Turkish oil, sometimes highly adulterated, for $1.10 per pound. Certainly here seems to be a great opportunity for the clever manipulator, and, aside from the assistance of a well-trained nasal organ, let us see what are the probabilities of detecting such adulteration.

Rose geranium oil is a colorless, yellowish, greenish or brownish liquid, depending on the manner of distillation and storage, of a pleasant, rose-like odor; specific gravity, from 0.8878 to 0.9073; optical rotation in a 100-mm. tube, −6° to 16°; ester, calculated as geranyl tiglinate, from 8 to 42 per cent. All varieties are soluble in 2–3 volumes of 70-per cent. alcohol, except the Spanish, which is rendered turbid by the presence of a small amount of separated paraffin. The chief constituents are geraniol and citronellol, the total, both free and combined, varying from 60 to 85 per cent. The former is usually in much the greater proportion.

Turkish or Indian geranium oil, also known as palmarosa, Indian grass-oil and rusa oil, usually closely resembles rose geranium oil in physical appearance, solubility, specific gravity and percentage content of alcohols and esters. In odor, there is frequently a close resemblance, and the optical rotation varies from +2° to −2°.

Ginger-grass oil is supposed to be an inferior quality of palmarosa oil. It should, therefore, have properties very nearly like those of the latter oil, excepting, possibly, its odor, unless it is highly diluted with turpentine or mineral oil, as is frequently the case.

It can readily be seen that a judicious mixture could combine oils possessing the properties described above so as to bewilder a chemist, even though he were well versed in the chemistry of essenital oils.

Jeancard and Satie * have studied these oils to some extent and think they can distinguish between them by their constants. The following table is taken from their work.

ANALYTICAL DATA FROM PURE GERANIUM OILS.

| Origin. | Density at 15° C. | Rotation at 15° C. in 100 Mm. | Saponification Value. | Esters. | Alcohols. |
|---|---|---|---|---|---|
| | | | | Per cent. | Per cent. |
| Cannes..... | 0.8972 | 9.40° | 54.60 | 9.80 | 66.31 |
| Spain ..... | 0.9073 | 7.30° | 65.80 | 7.84 | 66.23 |
| Corsica ..... | 0.9012 | 8.00° | 60.20 | 7.00 | 68.55 |
| Africa..... | 0.9006 | 8.06° | 65.80 | 8.08 | 63.19 |
| Bourbon ..... | 0.8905 | 8.20° | 74.00 | 6.65 | 71.28 |
| India ..... | 0.8960 | 0.48° | 43.00 | 11.30 | 84.62 |

The per cent. of esters and alcohols is based on the formulæ $C_{12}H_{20}O_2$ and $C_{10}H_{18}O_2$, respectively.

In view of the fact that the highest grade oils grow in certain localities only and bring fancy prices, the opinion is ventured that it would not be safe to make any positive statement from the above results, except in the case of Indian oil.

Some time ago the writer was sent a number of samples of geranium oils, with the request that an opinion be given as to their purity and quality. On submitting these samples to an investigation the results tabulated below were obtained.

* 1900, Bull. Soc. Chim. (3), 23, 37.

ANALYSIS OF GERANIUM AND ALLIED OILS.

| Kind of Oil. | Color. | Specific gravity at 15° C. | Acid number. | Esters as tiglinate, per cent. | Alcohols, per cent. | Optical rotation in 100 mm. | Solubility in 70 per cent. alcohol. |
|---|---|---|---|---|---|---|---|
| African (a).... | Greenish-yellow. | 0.8901 | 4.51 | 20.48 | 76.06 | — 6.73° | Sol. in 2 vols. |
| Algerian (a)... | Colorless. | 0.8964 | 2.87 | 36.46 | 73.14 | — 9.60° | Sol. in 2½ vols. |
| Reunion ..... | Lemon-yellow. | 0.8878 | 6.28 | 28.89 | 72.13 | — 7.66° | Sol. in 2 vols. |
| African (b).... | Lemon-yellow. | 0.8915 | 6.00 | 28.95 | 63.49 | — 8.41° | Insol. in 10 vols. |
| African (c).... | Orange-yellow. | 0.9053 | 6.09 | 18.95 | 42.34 | —19.20° | Insol. in 10 vols. |
| African (d).... | Lemon-yellow. | 0.9319 | 4.47 | 95.00 | 71.08 | — 7.70° | Sol. in 1¾ vols. |
| | | | | 78.85* | | | |
| Algerian (b)... | Lemon-yellow. | 0.8981 | 3.2 | 33.61 | 65.57 | —17.00° | Insol. in 10 vols. |
| Palmarosa ..... | Orange-yellow. | 0.8968 | 1.8 | 22.30 | 81.75 | — 2.90° | Sol. in 2 vols. |
| | | | | 18.50* | | | |
| Turkish (a) ... | Lemon-yellow. | 0.9142 | 4.13 | 12.13 | 50.00 | —50.70° | Insol. in 10 vols. |
| | | | | 10.06* | | | |
| Turkish (b) ... | Lemon-yellow. | 0.8154 | 2.41 | 14.25 | 72.93 | + 1.91° | Sol. in 2 vols. |
| | | | | 11.72* | | | |
| Ginger Grass (a) | Lemon-yellow. | 0.9213 | 1.5 | 8.07 | 20.18 | —69.13° | Insol. in 10 vols. |
| | | | | 6.69* | | | |
| Ginger Grass (b) | Lemon-yellow. | 0.9234 | 3.88 | 1.46 | 21.77 | —65° | Insol. in 10 vols. |
| | | | | 1.20* | | | |
| Rhodinol II. .. | Colorless. | 0.8758 | 0.00 | 9.00 | ..... | —26.9° | Sol. in 2 vols. |
| | | | | 7.42* | | | Insol. in more. |

* Per cent. of ester calculated as geranyl acetate.

The acid number was determined by dissolving a given weight of the oil in strong alcohol, in which all the oils were soluble in all proportions, and titrating with decinormal alcoholic potash, at the ordinary temperature, using phenolphthalein as indicator. The figures indicate the number of milligrams of potassium hydroxide required to neutralize the acidity of one gram of oil. The esters were estimated by adding an excess of alcoholic potash to the above solution, heating to boiling with a reflux condenser for about one hour, then titrating back the excess of alkali by means of decinormal acid. From the amount of alkali consumed the necessary calculations can readily be made, either as geranyl tiglinate ($C_{10}H_{17}CO_2C_4H_7$) or geranyl acetate ($C_{10}H_{17}CO_2CH_3$), as the case may require. The per cent. of alcohol, free or combined, was determined by acetylizing a given weight of oil with an equal amount of acetic anhydride, in the presence of fused sodium acetate. The acetylized product was purified by washing with water and rendered anhydrous by means of fused sodium sulphate. A given weight of the acetylized oil was then saponified, as outlined above for determining esters, and from the data thus secured the desired calculations were made.

In computing the amount of alcohol, both free and combined, in geranium oil, it must be remembered that the chief ester of the natural oil is a tiglinate and on acetylizing with acetic anhydride the free alcohols are

converted into acetic esters. We, therefore, have a mixture of esters on which to base our calculations. The above per cent. of alcohols was computed from the mixed esters. The question might be asked, but remains unanswered here, whether any of the tiglinic group was replaced by the acetyl group.

The first three oils are normal in every respect—African (b) and Algerian (b) can be considered normal except as to solubility. African (c) is low in alcohol content, high in optical rotation and insoluble in the proper amount of 70 per cent. alcohol. African (d) is a spurious product. This oil did not respond affirmatively for a hydroxyl group when tested by means of acetyl chloride in the conventional manner, thus indicating the absence of any alcohol. Palmarosa and Turkish b) are both normal India oils. Turkish (a) is an abnormal product. Both ginger grass oils are entirely different from anything described in literature. Judging from the high specific gravities and high optical rotations, these oils are not adulterated with either turpentine or mineral oil.

Rhodinol II. is supposed to be a fairly pure geraniol.

## INFERIOR DRUGS AND INSIDIOUS METHODS OF DECEPTION.

BY LYMAN F. KEBLER, CHIEF OF DRUG LABORATORY.

[Contribution from Bureau of Chemistry, U. S. Department of Agriculture, No. 1.]

The adulteration of medicinal remedies is brought to our attention from time to time, and it will probably not be denied by many that the basic facts as given to the public are, in the main, correct, but frequently the worst possible color is given them. There are, undoubtedly, members in the profession whose sense of honor is so distorted by rapacity and greed that they unconsciously, if not deliberately, drift into mendaciousness. These are the men who usually bring the craft into ill repute. Some of the excuses given by these dealers, when informed concerning the shortcomings of their goods, are both interesting and instructive. For example, they contend that it would not be safe to supply their customers with laudanum of full pharmacopœial strength, having in former days used a weaker preparation. Then again, some articles must be modified to suit the tastes of the public, such as imparting a certain color to a given preparation. Most of these excuses must be taken *cum grano salis*, but there are undoubtedly adulterations of long standing, such as "*limed nutmegs*," "*bleached ginger*," etc., that should be leniently dealt with at present, for it is well known that according to certain ancient methods of curing still practiced, the kernels of nutmegs and the rhizomes of ginger are treated with lime to ward off the ravages of insects. Every possible effort should be made to have goods of this character labelled so as not to mislead the consumer. The great difficulty in making any concessions whatever, is that it might be construed as extenuating the dealer's actions and thus embolden him in his insidious sophistry.

When the physician is called to guide a patient through an illness, his therapeutic knowledge is generally called into play and he prescribes for the sufferer on the basis of pure drugs. If he is deceived in the quality of the agents delivered and administered, abnormal symptoms may arise for which the doctor is unable to account, and consequently he is placed in a most embarrassing position. As can readily be seen, most disastrous results may ensue, for which the apothecary is responsible, a most unpleasant burden to bear through life. Many a physician realizes the gravity of the situation, and in self-defence, and for the welfare of his patients, he prescribes certain brands of recognized purity or carries or prescribes his own remedies, made for him by reputable firms, rather than trust the local druggist in the filling of his prescriptions.

During recent years federal and state authorities have enacted laws which, if properly amplified and conscientiously and intelligently enforced will in due time minimize the adulteration of medicinal agents and improve the quality of chemicals. These statutory laws generally recognize that there are numerous methods by which the quality of a commodity may be impaired. The object of this paper is to discuss some of these methods, cite examples met with in practice by the writer, and call the pharmaceutical and chemical world's attention to the various forms of adulteration.

## FORMS OF ADULTERATION.

Adulteration may be subdivided as follows:

1. *Conventional*, to suit the tastes and demands of the public.

2. *Accidental* or *Incidental*, arising from environment, carelessness, or incompetence on the part of the producer or manufacturer or their agents.

3. *Arbitrary*, to comply with or take advantage of certain fixed arbitrary standards, and last, 4. *intentional*, for gainful purposes and competition.

## CONVENTIONAL ADULTERATIONS.

Conventional adulterations, such as silvered cochineal, bleached ginger, and the artificial coloring of many products have been brought about in various ways. The original object in many cases undoubtedly was to trade on the credulity of the public, for it is a well-known fact that an attractive physical appearance is a great factor in the sale of goods and color usually carries with it an idea of strength and quality. Such a firm footing have these factors secured that in some cases the adulterated article is selected rather than the pure. To illustrate, a few years ago, while exhibiting a sample each of pure and weighted cochineal, a recent graduate of one of our well-known colleges, after looking them over thoroughly, selected the adulterated article as the genuine product. When informed of his error, somewhat chagrined at his mistake, he said: "It is the only kind I have ever seen, and of course thought it was the pure article." From this and

other similar experiences it would seem that some of our educational institutions are not exercising as much care as they might in the selection of some of their material for instruction purposes.

*Artificial Coloring.*—The artificial coloring of preparations is the most widespread of conventional adulterations. These pages will probably not come under the eyes of a single reader who is unable to enumerate a score of such products. To suggest a multitude of such goods it is only necessary to enumerate elixirs, tinctures, syrups, essences, pills and tablets. As long as the harmless vegetable colors were used, little cause for anxiety existed, but of late the danger line has been passed by the extensive use of the so-called "aniline dyes." The finding of harmful coloring agents in food products is a matter of common repute, and medicines have not escaped. It would probably not be desirable to interdict the use of harmless coloring agents, but their use should be discouraged. In cases where it is clearly evident that fraud is concealed by coloring agents, as is the preparation of vanilla extract from the chemical vanillin, dissolved in a suitable menstruum and properly colored with caramel, a suitable punishment should be provided.

It is quite possible that an attractively colored preparation is more palatable than one that is not colored, but if coloring is desirable the nature of the coloring agent should be plainly set forth on the label, unless it is part of a formula contained in some recognized authority like the Pharmacopœia or National Formulary.

*Bleached Ginger.*—The bleaching of ginger by covering the fingers with some white substance, like calcium carbonate, is frequently done to cater to the fancy of certain customers. It also seems to be incidental to certain processes of curing. In some cases, however, the prime motive is to conceal inferiority. The amount of coating added usually does not exceed five per cent. but the increase in price is about fifteen per cent. In bleaching ginger considerable care must be exercised in the selection of the fingers, or the shrinkage due to loss of moisture will be equal to the amount of weighting material added. At all events the purchaser of bleached ginger pays more money and gets less ginger than if he purchased the unbleached variety.

*Cochineal.*—It seems as if the cochineal industry is grossly involved in adulterations and according to some dealers irretrievably lost in this practice. They contend that it is almost impossible to purchase a pure article on the open market, but an investigation shows that this contention is not well founded. In fact the pure product is so easily secured that adulterated cochineal would be placed under the fraudulent form of adulteration, if it were not well known that the consumer virtually knows only the silvered or commonly adulterated variety.

The object of this work on cochineal was not to ascertain how much adulteration exists, but how difficult it is to obtain the pure article. It

was soon found that pure cochineal was readily available when demanded. A number of samples examined gave the following results:

ANALYSIS OF COCHINEAL.

| Serial No. | Source. | Kind. | Ash, per cent. | Adulterant. | Moisture, per cent. | Coloring matter. | | Price per lb. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Colorimetric. | 1 per cent. Sol. of $K_3FeCy_6$. | |
| 3 | ——— ——— | Silver. | 30.81 | Talcum. | 6.7 | 64 | 1.2 Cc. | $0.40 |
| 156 | New York ..... | Powd. | 17.25 | Earthy matter. | 6.25 | 50 | 1.0 Cc. | .45 |
| 157 | Philadelphia .... | Black. | 4.94 | none. | 7.00 | 100 | 1.8 Cc. | .45 |
| 158 | Philadelphia .... | Powd. | 6.00 | none. | 6.15 | 100 | 2.0 Cc. | .50 |
| 159 | Philadelphia .... | Silver. | 3.01 | none. | 6.38 | 92 | 1.3 Cc. | .40 |
| 165 | New York ..... | Black. | 4.71 | none. | 7.73 | 100 | 1.9 Cc. | |

Numbers 3 and 156 represent the goods delivered to the Bureau of Chemistry without specification. Number 159 was sent with the belief that it was adulterated. Numbers 157, 158, and 165 were delivered as pure goods, and an examination proved such to be the case. On account of the high price, variable quality and the customary adulteration of cochineal, suitable methods for readily determining its quality are very desirable.

The per cent. of ash is a fair index in determining the purity of cochineal, but this factor can easily be circumvented by the addition of starch mixing exhausted material with the pure article or moulding paste into small grains to resemble closely the outlines of the insects themselves. The ash of normal cochineal should never exceed 6 per cent.

The most reliable procedure in determining the quality of cochineal is to estimate the amount of carmine either colorimetrically or by one of the oxidation methods. J. Löwenthal's* well-known method for the determination of tannin can be employed to advantage only when considerable work of this character is done. F. Penny's † process appears to have many advocates. The basis of this method is the oxidation of the coloring material, in an alkaline solution, by means of a one-per-cent. solution of potassium ferricyanide. It is executed by digesting together, on a water-bath for one hour, one gram of powdered cochineal and five grams of caustic potash, dissolved in 20 Cc. of distilled water, avoid dissipation of the water, dilute the resulting mixture to 100 Cc. and titrate an aliquot

* 1877, Ztsch. Anal. Chem., 16, 179.

† 1855, Brit. Assoc. Advanc. Science, Part II, page 68.

part by means of the potassium ferricyanide solution. The carmine-red color is changed to a brownish-yellow. The transition of color is indistinct and the exact end-reaction is difficult to determine. In this work 20 Cc. of cochineal solution were used for each titration.

Excepting cases where cochineal is to be used for special purposes, a simple colorimetric method gives satisfactory results. For this purpose the following process is suggested: Digest on the water-bath for one hour one gram of powdered cochineal and one gram of potassium hydroxide, dissolved in 20 Cc. of water, replenish the water as it evaporates and make the mixture up to 100 Cc. with distilled water. Dilute 10 Cc. of this solution to 400 Cc. The color thus obtained, from a cochineal of known purity, is taken as the basis and called 100. If pure cochineal always possessed the same tinctorial value and was a well-known commercial article, the color obtained by the above procedure could be utilized as a standard. A readily available uniform standard is, however, found in a properly-diluted aqueous solution of potassium permanganate. It has been found that by diluting 12.5 Cc. of a centinormal potassium permanganate solution (0.316 Gm. of pure potassium permanganate dissolved in one liter of distilled water) to 100 Cc., a tint of color is obtained, when observed in a Nessler tube held at a right angle to the eye of the worker, which is identical to that prepared from pure cochineal by the process described above. By adopting this potassium permanganate solution as a *standard* and calling it one hundred, the tinctorial value of every sample of cochineal can be ascertained and definitely expressed. If a sample of cochineal should be found in the future possessing a higher coloring equivalent than any met in this work, the standard of comparison would not need to be changed but could be expressed by 110 or 125, etc., as the case may be.

According to the above method, numbers 157, 158 and 161 are of good and equal quality. Number 159 is of fair quality and numbers 3 and 156 are decidedly inferior, having only about one-half and two-thirds, respectively, the coloring value of a normal cochineal. It is interesting to note that the results obtained by the potassium ferricyanide process run nearly parallel with the colorimetric data.

A microscopic examination of number 159 indicates that the silvering is due to rod-shaped bodies, like bacilli; but the usual bacterial stains would not effect them. It is quite possible that the whitish appearance is due to a dried residue of cryptogamic plant growth.

The physical appearance of these conventionally adulterated articles has secured such a firm footing in the public mind that it is almost impossible to replace them by pure goods. To eradicate these deeply inculcated erroneous ideas will require years of patient efforts both by way of exposure and education.

ACCIDENTAL ADULTERATIONS.

Accidental adulterations are very wide-spread and it is frequently difficult to say where this form of adulteration ends and the fraudulent begins. Crude drugs usually contain admixtures of twigs, stems, dirt, foreign leaves and a host of other bodies. The Pharmacopœia does not make any allowance for contaminations of this kind, but dealers contend that such hypothetical requirements are purely academical and do not have a place in the commercial world. The argument is also advanced that certain drugs are collected by ignorant. semi-civilized people who cannot be expected to eliminate impurities of this character. Excuses of this nature do not in any way free dealers and manufacturers from their responsibilities to the public. It is plainly their duty to handle and use only goods of the proper quality. To what extent some of these foreign articles modify the primary action of a drug cannot be conjectured.

A certain few of the large drug houses of this country are eliminating these impurities by *garbling*. When it is remembered that the foreign material frequently amounts to 20 per cent. or more it is quite evident that the cost of garbled goods is materially increased, and the dealers in clean drugs are distinctly handicapped, when brought into competition with those who handle inferior grades. It would probably be unjust to request a complete absence of foreign material, but a maximum limit could readily be fixed.

A concerted effort should be made by all large manufacturers to establish a uniform high standard for all drugs used by them either in the making of finished medicinal remedies or for powdering. All purchases should be made on the basis of an adopted standard, paying only for the actual amount of good material in a consignment.

By a recent act of Congress the Secretary of Agriculture is authorized to investigate the quality of drugs imported into this country. The Drug Laboratory has already taken steps towards the securing of samples which will be carefully investigated, in co-operation with the Bureau of Plant Industry of the Agricultural Department and the microscopist of the Bureau of Chemistry.

It would probably be too exacting to require a root to be freed from all extraneous matter, but an upper limit of ash should certainly be fixed. Some time ago a sample of golden seal root was received, which was intended for powdering, that contained 23.8 per cent. of ash and 2.02 per cent. of hydrastine alkaloid, based on the air-dried material. A normal root should not contain more than 10 per cent. of ash and not less than 2.5 per cent. of hydrastine alkaloid. With golden seal at 60 cents per pound this dirt is a profitable addition for some one.

Certain leaves almost always contain a considerable amount of foreign matter. *Chimaphilla leaves* have been seen which were admixed with 25 per cent. of stems. A sample of *jaborandi leaves* recently examined con-

tained not less than 16 per cent. of twigs and stems. A *coca leaf* sample, on assay, indicated 0.52 per cent. of cocaine alkaloid, but the leaf was mixed with at least 18 per cent. of foreign material. No valid excuse exists for this evil. *Coca leaves* containing as little as 3 per cent. of foreign matter are readily available.

A sample of *cubeb berries* on examination gave the following results: Stems, 15 per cent.; worthless berries, 11 per cent.; oil, 6.38 per cent. The physical appearance of the oil was good; its specific gravity 0.9384 and optical rotation −34.6°. The gravity is a little high, but can hardly be considered abnormal. Good berries should yield not less than 12 per cent. of oil.

*Deteriorated Drugs.*—The above sample of cubeb berries serves as an excellent example of transition between drugs containing foreign admixtures and those that have deteriorated by age or manner of keeping. To what extent these cheap, inferior, and in some cases worthless, goods are used it is difficult to ascertain, but, from information vouchsafed by brokers, drug-millers and manufacturers, this practice obtains to a considerable extent all about us. Deteriorations are incidental to the drug business, but the use of such goods, knowingly, in the manner indicated is fraudulent, and what makes this practice so extremely reprehensible is the fact that it is very difficult, if not impossible, to detect inferior material of this character when powdered with goods of prime quality.

Articles particularly susceptible to change, due to time, are those containing essential oils, such as cinnamon-bark, clove-buds, lavender flowers, peppermint herb, sandalwood chips, etc. A hundred-pound package of *cinnamon bark chips*, when submitted to distillation, yielded only enough oil to impart a distinct flavor of cinnamon to five gallons of the aqueous distillate. Potent drugs deficient in alkaloid strength, due to old age, improper collection or damage in transportation, are frequently used. Old *jaborandi leaves*, deficient in alkaloidal strength, are met with sometimes; *belladonna leaves* improperly collected are not uncommon, and damaged *coca leaves* are occasionally placed on the market. In some cases the manufacturer is not cognizant of these things, but this does not excuse him.

*Chemicals.*—No less an authority than E. W. Morley, during an interview, said: "It is virtually impossible to make a chemical absolutely 100 per cent pure." From this it would seem that we must expect to find a small amount of foreign material in all chemicals. Experience shows such to be the case. These impurities are usually incidental to the process of manufacture, but when the amounts are excessive it must be ascribed to either carelessness, ignorance, or a desire on the part of the manufacturer to prepare a cheaper article at the expense of purity. A few examples will serve to illustrate these points: *Potassium iodide C. P.* contained sulphate, iodate, sodium, 1½ per cent of chloride, and 5 grams

required 3 Cc. of decinormal acid to neutralize the alkalinity. An article of this character would not be accepted for medicinal purposes. Potassium bisulphate C. P. contained only 33 per cent. of the acid sulphate; the rest consisted of potassium sulphate, moisture and chloride. These serve as examples of the quality of some of the C. P. chemicals. A little agitation will undoubtedly rectify laxness of this character.

### ADULTERATIONS DUE TO ARBITRARY STANDARDS.

The argument is occasionally advanced that arbitrary standards are direct incentives to fraudulent dealings. Fluid extract of nux vomica prepared from a bean containing 2.5 per cent. of total alkaloids is diluted, to conform to a standard, so that it contains only 1.5 per cent. of alkaloids. Milk dealers reduce milk containing 5 per cent. of fat, so as to pass a 3 per cent. standard. The former is considered proper, the latter reprehensible to a high degree. In reality the one does not appear to be any worse than the other.

The United States Pharmacopœia prescribes an upper and a lower limit of morphine for powdered opium, but no provisions are made to reduce an opium containing more than 15 per cent. of morphine, the highest amount permissible, so as to conform to the proper requirements. It is not uncommon to meet with powdered opium containing over 15 per cent. of morphine, and dealers are compelled in self-defence to reduce it to the proper strength with some inert substance or use it in the manufacture of other medicinal remedies containing morphine. In fixing a standard it is desirable to place it as high as possible, but adequate provision should be made so that the requirements can readily be complied with.

Some dealers maintain that the pharmacopœial requirements of certain oils are abnormal, and adulteration must be resorted to if oils of the desired quality are supplied. Much capital is made of this in certain quarters by quoting such oils as bay, coriander and pimento, "compounded to conform to the requirements of U. S. P. 1890," from 30 to 60 per cent. below the price asked for pure oils, which are not expected to comply with the pharmacopœial standards.

The most important factor in judging the quality of *oil of bay*, aside from its peculiar odor, is the specific gravity, which should lie, according to the pharmacopœia, between 0.975 and 0.990 at 15 degrees C. An examination of ten samples of pure oil of bay obtained directly from the distillers gave specific gravities varying from 0.958 to 0.980. All but two fell below the lower limit. Other recognized authorities allow a lower limit of 0.965. Three of the above samples fell below this standard, being 0.958, 0.9627 and 0.964. On submitting 511 pounds of bay leaves to steam distillation 12.5 pounds of oil were obtained, which, after ageing one year, had a specific gravity of 0.955. It would therefore seem as if the specific gravity of the pharmacopœia for oil of bay was a little too high.

Six samples of *coriander-seed oil* were examined; of these three were marked pure, two were distilled by the writer, and all complied with the U. S. P. requirements. The sixth was marked "German," and proved to be adulterated. The pharmacopœial standard is therefore not far from the truth.

Six samples of *oil of pimento berries* were tested. Their specific gravities were as follows: 1.0494, 1.0510, 1.0280, 1.034, 1.040, and 1.035. In other respects these oils complied with the pharmacopœial requirements.

The first two were labeled, "Made to conform to the U. S. P. requirements." The last was distilled by the writer, and the others were secured from prominent distillers in this country, and guaranteed pure. The Pharmacopœia requires the specific gravity to fall between 1.045 and 1.055, but "Die Ætherischen Œle," by Gildemeister and Hoffmann, recognizes specific gravity as low as 1.024. While the specific gravity is, to a certain extent, an indication as to the amount of eugenol present, in view of the above facts, it would not be wise to pronounce an oil adulterated simply because it had a specific gravity below 1.045.

*Potassium cyanide*, 98 to 100 per cent. pure, has assumed considerable commercial importance. In ordering this article it is customary to specify the per cent. of cyanide only. For financial and technical reasons potassium cyanide is largely mixed with sodium cyanide. There can be no real objection to this practice, if the goods are properly represented, but a mixture of these two cyanides should not be delivered for 98 to 100 per cent. potassium cyanide. In determining the per cent. of potassium cyanide in a mixture of this character, the results will be above 100 per cent. in proportion to the amount of sodium cyanide present. In order to meet this difficulty manufacturers add or do not remove certain inert substances which usually consist of carbonates, chlorides, or mixtures of both.

An examination of four samples of potassium cyanide, labeled 98 to 100 per cent. pure, gave the following results:

THE ANALYSES OF 98 TO 100 PER CENT. POTASSIUM CYANIDE.

| Cyanide calculated as KCy. | Potassium Cyanide. | Sodium Cyanide. | Potassium Carbonate. | Moisture at 125° C. | Sodium Chloride. |
|---|---|---|---|---|---|
| Per cent. | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| 101.00 | 33.65 | 50.56 | 0.70 | 0.82 | 14.27 |
| 111.19 | 13.62 | 73.65 | 12.82 | 0.00 | 0.00 |
| 105.87 | 31.75 | 55.93 | 12.32 | 0.00 | 0.00 |
| 95.33 | 65.90 | 22.20 | 8.82 | 1.58 | 1.66 |

All of the above samples represent imported goods. The results are self-explanatory. No valid reason for this practice has thus far been offered by manufacturers.

### INTENTIONAL ADULTERATIONS.

With very few exceptions the underlying motive of all adulterations is monetary gain. Some of the sophistications considered above appear to have some superficial excuse for existing, but those enumerated under the intentional variety are deliberately premeditated misrepresentations and should be summarily dealt with. In this category comes the potassium cyanide reported above. Other instances are: *borax* diluted with *sodium bicarbonate*, *corn starch* delivered when *St. Vincent arrow root* is asked for, *prime quality drugs* mixed with *inferior* or *partially exhausted* goods, spurious *sandalwood oil* containing chloroform, added to raise the specific gravity and to increase the apparent content of *santalol*, *powdered drugs* in the preparation of which *inert* and *deteriorated* products have been used, *beeswax* with its numerous adulterations, *turpentine* diluted with *kerosene*, etc.

A sample of beeswax recently examined was found to contain 33 per cent. of cassava starch. This variety of starch indicated that the adulteration was of southern origin. On inquiry it was found that about $800.00 worth of this fraudulent material had passed through the New York custom house, having been imported from Mexico.

Another sample of beeswax, on examination, gave the following results: Melting point, 61.5° C.; specific gravity at 15° C., 0.959; acid number, 14.2; ether number, 73.6. These numbers do not materially differ from those usually recognized as normal for pure beeswax, excepting the acid number, which is a little low. A qualitative examinatian showed that this article consisted, for the greater part, of a high melting-point ceresin and Japan wax, the mixture probably flavored artificially to resemble the genuine product. New York is the home of the apiary which produced this remarkable beeswax.

The Drug Laboratory has in its possession a small amount of a flavoring agent which has been exploited as of much service in beeswax adulteration, but the nature of its composition has not as yet been determined.

The finding of a beeswax adulterated with starch is interesting, because it shows that the days of gross sophistication are not passed, but the unearthing of a scientifically-prepared mixture closely resembling beeswax is deplorable, because it indicates that men of education are debasing their talents in the most shameful manner.

Twenty five per cent. of all turpentine, as usually purchased in small packages, is liberally adulterated with kerosene. The present analytical methods do not appear to be sufficiently refined to establish this adulterant with accuracy when present in small quantities. Investigations are under way at present which are hoped will remedy this defect.

### SIFTINGS AND SWEEPINGS.

In the handling of drugs, more or less of the finer particles escape from

the bales, and in the larger warehouses the practice has been established of collecting this material from the floors, as occasion requires, and offering it to the trade at a low figure. The conditions under which these sweepings and siftings are accumulated and collected naturally leads to the belief that they are liable to be contaminated to a considerable degree. Products of the above character commonly met with are the cinchona barks, cochineal dust, pepper, tea and senna leaves.

Some of the sweepings and siftings are utilized in extracting certain active principles, like caffeine from tea sweepings, and certainly nothing could be said against an economy of this character, but the practice of using articles of this character in the manufacture of galenical preparations ought certainly to be strongly denounced. Some manufacturers frankly admit that this practice obtains in their works, but maintain that these goods are "just as good" as those for which a high price is paid.

Three bales of calisaya bark siftings, on examination, gave the following results: All contained foreign material; the per cent. of total alkaloids was 0.47, 3.6 and 4.7; the per cent. of ether-soluble alkaloids, not determined in the first recorded, and 1.9 and 2.7, respectively, in the last two. A good calisaya bark should not contain less than 6 per cent. of total alkaloids or less than 3.5 per cent. of ether-soluble alkaloids.

Every bale of senna-siftings and every bag of tea-sweepings examined contained a goodly proportion of extraneous matter. Broken senna leaves are usually of good quality.

### A COMMON METHOD OF DECEPTION.

A very significant editorial appeared in the Brit. Food Journal, 1903, Vol. 5, page 97, from which the following extract is taken: "The substitution of an imitation of some kind for the article actually asked for or desired by the purchaser is a particularly mean form of deception which is practiced nowadays to an almost incredible extent. It is astonishing and mournful that so many persons should be concerned in the initiation, fostering and carrying on of so shameful a system, and that others are found who, in speech and print, seem willing to lend to it either their countenance or condonation." Reprehensible as are these dealings, they are hardly as iniquitous as is the practice of submitting a sample of prime quality, then, on receipt of order, delivering goods of an inferior grade. Dealings of this character do not seem to be the fault of the individual, but the fault of an unfortunate system of internecine struggle, constantly being carried on to achieve the ideal of success.

Some may think that the above method of deception does not obtain to any extent, but only a superficial investigation will show that it permeates many lines of business, and those who are responsible for the quality of the medicinal remedies supplied the unfortunate sick should ever exercise eternal vigilance. The following examples, which are typical of

this practice should serve to banish the remotest doubt: *Belladonna leaves*, sample contained by acid titration 0.438 per cent. of total alkaloids. On receipt of the consignment, delivered as per sample submitted, nine bales were tested, with the following result: 0.12, 0.14, 0.11, 0.10, 0.13, 0.12, 0.13, 0.30, 0.11 per cent. of total alkaloids. *Potassium bromide* sample complied with U. S. P., 1890, requirements. The goods supplied were inferior in every respect. *Podophyllin* sample of U. S. P. quality; article delivered contained much material insoluble in alcohol. *Linseed meal* sample contained 33 per cent. of pure oil. After placing an order on the strength of the sample, two carloads were delivered, which, on examination, proved to contain on the average 35 per cent. of oil, having the following properties: Specific gravity at 15° C., 0.9055; acid number, 6; saponification number, 99.7. The oil extracted from the linseed meal was highly adulterated with mineral oil, which was added to the flaxseed meal after a part of the natural oil had been expressed. *Oil of wormwood* sample of good quality; goods delivered adulterated with turpentine. Sample of *tea-sweepings* submitted contained 2.64 per cent. of caffeine alkaloid. A ton subsequently delivered contained only 1.6 per cent. of this alkaloid. Sample of *caramel* possessed a coloring equivalent of 100 and tested up well in every respect. On examining a delivery of about 5,000 pounds, it was found to have only a coloring equivalent of 80, and deported itself badly in every respect. These examples could be largely extended, but the above fully illustrate existing conditions.

In conclusion, the writer wishes to thank Messrs. Smith, Kline and French Company, of Philadelphia, Pa., for the courtesy extended him of freely utilizing any and all observations made while in their employ, that may be of service to the Drug Laboratory.

## IRON PEPTONATE.

BY LEONARD A. JOHNSON, PH. G.

The preparation of this compound of iron from egg albumen seems to present some difficulty, even so much that some who have tried to make it have given it up and pronounced it a failure.

I have found the formula, presented in Oldberg's Inorganic Chemistry, vol. II, pages 404, 405, to give very satisfactory results with a slight modification of a part of the directions.

The formula reads:

| | |
|---|---|
| Solution of oxychloride of iron (containing 3.5 per cent. of Fe.) | 240 parts. |
| Dried egg albumen | 20 parts. |
| Hydrochloric acid (25 per cent. of HCl) | 34 parts. |
| Pepsin | 1 part. |
| Distilled water, a sufficient quantity. | |

Dissolve the egg albumen in 2000 parts of distilled water, to which has

been previously added the pepsin together with 30 parts of the hydrochloric acid. Let the mixture stand, stirring or shaking it occasionally, for a period of twelve hours in a place where the temperature is about 40° C. Then let the solution cool to 20° C., filter or strain it and carefully neutralize it with a very weak solution of sodium hydroxide. Should a precipitate be formed, filter the liquid.

Dilute the solution of ferric oxychloride with 2000 parts of distilled water, and add this solution to the solution of digested egg albumen. Mix well.

Wash the precipitated iron peptonate with distilled water as long as the washings give a *precipitate* with silver nitrate solution. (The washings should not be continued when mere opalescence is caused by the silver solution.)

Collect the precipitate upon a cloth strainer, let it drain well, transfer it to a porcelain dish, add the remaining four parts of the hydrochloric acid, and heat the mixture carefully over the water-bath, at not over 56° C., until solution is effected.

Evaporate the liquid at not above 50° C. to the consistence of a syrup, spread the thick liquid upon glass plates, and let it dry in scales.

*Notes.*—It is well to powder the albumen before mixing it with the pepsin solution, that early solution may be effected, thus facilitating the peptonization of the albumen, which is usually accomplished in the twelve hours of digestion. The solution should, at the end of the period of digestion, be tested for albumen with heat and nitric acid, and if present, it should be subjected to further digestion until its absence is indicated by the previous tests.

As the iron solution is slightly acid, no precipitate will come down until this acid is neutralized.

This precipitate, which is very light, red-brown, is somewhat difficult to wash, as it settles out slowly and unevenly. When it is poured upon the strainer it runs through very readily, especially if the least pressure is applied.

To obviate this difficulty it is only necessary to pour the precipitate after the last decantation upon a cloth strainer placed on a frame, returning to the strainer any precipitate that might pass through. Allow it to drain well, after which the excess of water can be pressed out by careful manipulation.

To make the solution of the precipitate quickly and easily (which has been the most difficult part of the operation to many who have tried to make it), I find it necessary to deviate from the directions given in the formula.

Mix a small portion of the precipitate with a small amount of water and add about one of the remaining 4 parts of hydrochloric acid; heat on a water-bath to 40° C., stirring well, until solution is effected. Add more

precipitate to this solution in small portions at a time, stirring well until each portion has dissolved before adding another. Maintain a temperature of about 40° C. during the whole process.

When the solution becomes saturated with the precipitate, add another part of the acid, and saturate again with small portions of the precipitate.

Proceed in this way with alternate additions of small amounts of the acid, and subsequent saturation with the precipitate, until all the acid has been added and all the precipitate dissolved.

The precipitate is insoluble in concentrated hydrochloric acid, without reduction of the iron. Therefore, enough water must be present to dilute the acid fairly well, and if this amount is not present in the moist precipitate, it must be added.

If the quantities operated upon are small, all the acid may be added to the water at once, and the precipitate dissolved in this as directed; but if the quantities are larger, the whole amount of acid to be added will be largely in excess of the small amount of precipitate first added and will prevent the solution. The whole object of adding small amounts of the acid and subsequent saturation with the precipitate is to prevent, at any time, a large excess of acid and to keep the water at a minimum.

A fairly concentrated solution of the salt is a much more effective solvent for it than a more dilute one; so it is advantageous to prevent a large excess of water which would be necessary if all the acid were added to the water at once; besides, it must all be evaporated off, which should be done at 40° C.

This compound is very sensitive to heat, and if its solution is exposed even to 40° C. for a long while, the scales will be very dark, in fact, almost black. These are less soluble than the lighter ones.

Neither the light nor the dark scales are very soluble in cold water, but form a clear, permanent solution when digested with water at about 40° C. for a short while, which solution mixes well with alcohol, but is precipitated with concentrated hydrochloric acid in excess.

The scales, when assayed, yield from 28 to 31 per cent. of iron.

The following formula gives a product which assays the same per cent. of iron, is slightly more soluble, and is not quite so dark as that made by the foregoing formula:

| | |
|---|---|
| Solution of ferric chloride | 65 parts. |
| Ammonia water (sp. g., 0.96) | 65 parts. |
| Egg albumen, dried | 20 parts. |
| Hydrochloric acid (25 per cent. of HCl) | 34 parts. |
| Pepsin | 1 part. |
| Distilled water, a sufficient quantity. | |

Dilute the ammonia water with 65 parts of water, and add it to the solution of ferric chloride in small portions at a time, stirring well after

each addition, until the precipitate formed has redissolved, before adding another portion. Dilute with 2000 parts of water.

Prepare the peptone solution from the albumen, hydrochloric acid (30 parts) and pepsin, according to the first formula; cool to 20° C.; neutralize and filter.

Mix the iron and peptone solutions, neutralize with a 1-per cent. solution of sodium hydroxide; wash the precipitate and proceed to dissolve it according to the notes under the first formula.

I find this formula to work as well as the first one. In fact, the precipitated iron peptonate settles out well and is more easily washed than that from oxychloride. It requires more washing, however, to free it from chlorides, but this can be done more quickly and without loss of the precipitate.

The reason for adding the ammonia water in small portions to the solution of ferric chloride is to prevent a gelatinous mass which would be formed if all the ammonia water were added at once, and which could not be redissolved.

The iron solution thus prepared contains an amount of iron equivalent to that in 240 parts of the oxychloride of iron solution, containing 3.5 per cent. of iron, whereas the amount of iron present in the oxychloride solutions prepared by some formulas is between 2 and 3 per cent; I found some samples to yield only 2.2 per cent. of iron.

*Northwestern University, School of Pharmacy, Chicago.*

## APPROXIMATE ESTIMATION OF SULPHIDES.

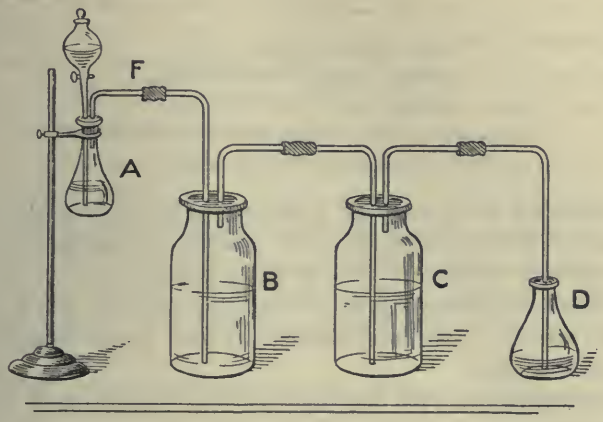
BY R. H. FRENCH.

The subject of this paper was brought to the writer's attention when in the laboratory of the Wm. S. Merrell Chemical Company. It was necessary to pass upon the value of a number of lots of calcium sulphide (Calx Sulphurata, U. S. P.) of different makes and shipments. All were bought as U. S. P. articles, which, however, was found to mean little. The U. S. P. requires, at least, 60 per cent. pure calcium monosulphide (CaS), and gives a test for ascertaining whether it is up to strength or not. The test is as follows: "If 1 Gm. of sulphurated lime be gradually added to a boiling solution of 2.08 Gms. cupric sulphate in 50 Cc. of water, the mixture digested on a cold bath for fifteen minutes, and filtered when cold, no color should be imparted to the filtrate by one drop of potassium ferrocyanide T. S. (presence of at least 60 per cent. calcium monosulphide).

Few samples under the writer's observation complied satisfactorily with this test, but, as it was afterwards found, some samples actually came up to the requirements of the U. S. P. in pure sulphide content, when tested by the method devised.

This led to an examination of samples of calcium sulphide from different sources, and in order to estimate, at least approximately, the amount of calcium monosulphide the following method was devised:

The method is based on the test of the U. S. P. The apparatus is arranged as shown in the diagram. *A* is a four-ounce Erlenmeyer flask,




provided with a good, two-holed rubber cork. In one hole a small separatory, with a long stem, is placed, and in the other a glass tube connecting this flask with *B*. This flask is supported on a small retort-stand in such a way that it may be conveniently heated and shaken. The glass tube connecting *A* and *B*, *B* and *C* and *C* and *D* must have a rubber connection in each to allow for shaking.

*B* and *C* are ten-ounce, tall, wide-mouthed bottles, fitted with good, tight, two-holed stoppers and properly connected by glass tubing. *D* is a four-ounce Erlenmeyer flask. In *A* place 0.500 Gm. of sulphide to be tested (in cases of a very poor sulphide 1.000 Gm., or even more may be needed). *B*, *C* and *D* are filled two-thirds full of a saturated solution of c. p. copper sulphate. The whole apparatus must now be connected absolutely tight. Admit 5 or 10 Cc. of water through the funnel tube into *A;* then add very slowly and with continuous shaking concentrated hydrochloric acid, until effervescence ceases; then a slight excess. *B* and if necessary, *C* must be shaken during the evolution of the gas. Now apply heat to *A* until all the gas is driven over, which is soon accomplished; quickly disconnect *A* and *B* at *F*. *B* almost always contains the entire amount of the ppt. of cupric sulphide, although if the evolution of gas has been allowed to become too violent, some unabsorbed hydrogen sulphide may pass on to *C* and *D*, for which reason they are placed as a safeguard.

The precipitate is now collected on an ash filter, washed with distilled water until the washings no longer give a test for copper with ammonia or potassium ferrocyanide, then washed a few times with hydrogen sulphide water. Dry quickly at 100° C., transfer the copper sulphide to a tared porcelain crucible, burn the filter adding the ash to the crucible, sprinkle

with sulphur and ignite strongly in a current of hydrogen sulphide for one hour, or to a constant weight. Weigh as ($Cu_2S$) cuprous sulphide.

The calculation is then made from the cuprous sulphide found as follows:

$$2CaS+4HCl=2CaCl_2+2H_2S.$$
$$2CuSO_4+2H_2S=2CuS+2H_2SO_4.$$
$$2CuS+\text{heat}+O_2=Cu_2S+SO_2.$$

$Cu_2S$ : 2CaS : : weight of $Cu_2S$ found : x or CaS found.

*e. g.* 1.000 Gm. $Cu_2S$ = 0.9114 Gm. CaS.

With this factor the percentage result is then readily calculated.

This method has been used on quite a variety of samples and by different analysts with concordant and most satisfactory results. It is to be admitted there is opportunity for discrepancy to occur, but in the hands of a careful worker it gives most satisfactory and expedient results, which is just what is wanted.

The following figures were obtained from the estimation of samples, as before mentioned.

| | | Duplicates. |
|---|---|---|
| No. 1 | 28.16 per cent. | 27.73 |
| No. 2 | 25.15 per cent. | 25.5 |
| No. 3 | 64.1 per cent. | 64.45 |
| No. 4 | 51.85 per cent. | 51.14 |
| No. 5 | 57.81 per cent. | 58.1 |
| No. 6 | 64.9 per cent. | 64.5 |
| No. 7 | 69.8 per cent. | 70.00 |
| No. 8 | 2.73 per cent. | 2.63 |

No. 2 is the same sample as No. 1 after standing six weeks loosely corked.

All the above samples came from manufacturers or jobbers, except No. 8, which was purchased from a drug store, and taken from a freshly opened package, the package, however, having been in stock for a long time.

The above estimations show:

1. That it is necessary to watch closely the calcium sulphide on the market, a great deal being almost entirely worthless.

2. That it is possible to get a good standard article up to the requirements of the U. S. P.

3. That it is necessary to keep it in air-tight sealed containers.

This method has also been satisfactorily used in estimating barium sulphide, both in combination and alone. The quality of barium sulphide thus far found in the market is very inferior.

Considering the above facts, there seems to be no doubt but this method will be satisfactorily applicable to all readily decomposable sulphides.

## A NOTE ON SOME NEW REACTIONS FOR ANTIPYRINE AND SALOPHEN.

BY GEORGE M. BERINGER.

The chemist is always alert to discover new and distinctive reactions, and the pharmaceutical chemist is especially interested in obtaining characteristic reactions for the synthetic products that have been introduced into medicine. The object of this note is simply to record a few observations in this connection which are believed to be original.

*Antipyrine.*—On agitating a small quantity of antipyrine with some solution of chlorinated soda, it was observed that the odor of the chlorine oxides was soon dissipated, and slowly the liquid attained an odor like that of essential oil of almonds. The change came on slowly and the odor grew in intensity for several hours, until the reaction was completed. The composition of this odorous product remains to be further investigated.

On agitating some antipyrine with chlorine water, the color and odor of chlorine promply disappears and there is formed a copious white amorphous precipitate, evidently a chlorine substitution product.

*Salophen.*—The color reaction most usually given in the books for this product is "that if a solution of salophen in alkali hydroxide be boiled, the solution takes a blue color, spreading from the surface through the solution." In the application of this reaction the writer finds that the resulting colors are not uniform and appear to depend upon the strength of the alkali solution as well as the amount of salophen used. If the alkali hydroxide solution is weak, then a pink-violet to a red solution will result without any blue surface layer. If, however, more concentrated solutions (1–2 or 1–4) are used, then the color may be a dark violet, almost purple, or it may be blue.

As salophen is almost insoluble in water (requiring 900 parts of hot water for solution), it seems impossible to apply tests to aqueous solutions. On shaking a small amount of salophen with 5 Cc. of solution of chlorinated soda, and then setting the tube aside, it was observed that there was produced a green color around the undissolved salophen, and this gradually strengthened and colored the entire liquid to a pale apple-green, changing slowly to a green-yellow.

The following is a distinct, and I believe a characteristic test for salophen: 0.1 Gm. is boiled for one minute with 2 Cc. of solution of sodium hydroxide (1–2) then allowed to cool, and 5 Cc. of solution of chlorinated soda added. There is immediately produced a deep and bright-green color. After some time, this changes to a deep mahogany-brown. This change to a brown color takes place slowly in the cold, but more rapidly if the solution is boiled. On supersaturating the solution, either when green or when brown, with a concentrated mineral acid, the color changes to a bright scarlet, and then slowly fades to a red-orange or mandarin color.

The play of colors is positive, rich and strikingly characteristic, and I have not found any other product reacting in any way similar.

If instead of 0.1 Gm. of salophen, one uses in the test only a few milligrams, there is still obtained a distinct green color of a much lighter tint, but the solution soon changes to a pale-yellow, and the subsequent color changes do not occur, and mineral acids render the solution colorless.

## ON GLYCEROPHOSPHORIC ACID AND GLYCEROPHOSPHATES.

BY F. RABAK AND E. KREMERS.

A continuation of the study begun by Windes and Kremers, and reported in abstract at the Philadelphia meeting (Proc. A. Ph. A., 50, p. 429). By repeating the esterification experiments under diminished pressure, an almost theoretical yield of acid was obtained. Several additional salts were studied, attempts to find out something about the constitution were made, and the literature brought up to date.

## THE CHARACTERIZATION AND CLASSIFICATION OF THE SESQUITERPENES. V.*

BY OSWALD SCHREINER.

### OCCURRENCE OF THE SESQUITERPENES IN THE VEGETABLE KINGDOM.

The sesquiterpenes are usually found in volatile oils as such, or in the form of sesquiterpene hydrates,† alcohols belonging to the so-called camphor group. These hydrates, by dehydration, give rise to sesquiterpenes, which are rarely identical with a natural sesquiterpene, being more often distinctive compounds. Many oils, such as cedarwood, sandalwood, copaiba balsam, gurjun balsam, ginger, cubeb, etc., consist principally of a sesquiterpene or a sesquiterpene hydrate. The latter compound is found more often in oils distilled from old drug, and thus appears to be produced from the sesquiterpene during the ageing process, although the exact conditions for this change are not known. In other oils the sesquiterpene is present in almost insignificent quantities only.

The occurrence of the sesquiterpenes in the vegetable kingdom is given in a tabulated form in the following pages. The arrangement is that of Engler's syllabus of plant classification. Such a tabulation shows that the sesquiterpenes are very widely distributed as products of plant life. The list includes thirty families, comprising fifty-eight genera and upward of

* Pharm. Archives, 1, p. 209; 2, p. 273; 4, pp. 61, 141; Proc. Amer. Pharm. Assoc., 1899, p. 158; 1901, p. 329.

† Under the term sesquiterpene hydrates only alcohols of the formula $C_{15}H_{25}OH$ are to be understood. There seems to be a tendency to designate all high boiling alcohols obtained from volatile oils as sesquiterpene hydrates. This is especially true of the alcohols $C_{15}H_{23}OH$, which are evidently not sesquiterpene hydrates at all, but the hydrates of a hydrocarbon $C_{15}H_{22}$, belonging to a series of hydrocarbons less saturated than the sesquiterpenes.

seventy-two known species. The number of volatile oils in which sesquiterpenes have been found is upward of seventy-nine, some of these being obtained from unknown botanical sources.

The lack of characterization of the sesquiterpenes makes it impossible to draw any general conclusions, but a few interesting facts are nevertheless brought out by such a tabulation. In the pine family, for instance, it will be seen that the sesquiterpene cadinene is restricted to the needles. Again, two distinct sesquiterpenes may occur in different parts of the same plant, as in the case of *Juniperus virginiana*, where cadinene occurs in the leaves, and cedrene in the wood. It is also interesting to note that closely allied species may contain different sesquiterpenes, thus, for instance, *Piper nigrum* contains caryophyllene, and *Piper betle* and *Piper cubeba* contain cadinene.

Such an arrangement into families may often indicate relationships between the sesquiterpenes as well. Thus, for instance, the sesquiterpenes found in the pine family are all, with the exception of the cedrene from the wood of *Juniperus virginiana*, cadinene. The close relationship between *Acorus calamus* and *Acorus spuriosus* makes it probable that the same sesquiterpene is contained in both. A similar relationship might exist in the case of the *Copaifera* species, *Dipterocarpus* species and others, although no general conclusion of this nature can be drawn. A botanical relationship of this kind can merely indicate a possible chemical relationship of the sesquiterpenes contained in the plant, but this must in all cases be substantiated by a careful comparison of physical constants, and, when possible, by the preparation of characteristic derivatives.

OCCURRENCE OF SESQUITERPENES IN THE VEGETABLE KINGDOM.

| | Cadinene. | Caryophyllene. | Humulene. | Santolene. | Zingiberene. | Uncharacterized Sesquiterpenes. | Sesquiterpene Hydrates. |
|---|---|---|---|---|---|---|---|
| *Pinaceæ.* | | | | | | | |
| Pinus silvestris—Pine-needle oil. | | | | | | | |
| Pinus montana—Needle oil of —. | | | | | | | |
| Picea excelsa—Needle oil of —. | | | | | | | |
| Tsuga canadensis—Hemlock or spruce needle oil | ? | | | | | | |
| Abies alba—Pine (white fir) needle oil | ? | | | | | | |
| Cedrus atlantica, var. of C. libani—Atlas cedar oil. | | | | | | | |
| Juniperus communis—Oil of juniper berries. | | | | | | | |
| Juniperus oxycedrus (distruct. dist.)—Oil of cade. | | | | | | | |
| Juniperus sabina—Oil of savin. | | | | | | | |
| Juniperus virginiana—Oil of cedar leaves. | | | | | | | |
| Juniperus virginiana—Cedarwood oil | — | — | — | — | — | Cedrene. | Cedrol. |
| *Gramineæ.* | | | | | | | |
| Andropogon nardus—Citronella oil. | | | | | | | |
| Andropogon muriaticus—Vetiver oil. | | | | | | | |
| *Araceæ.* | | | | | | | |
| Acorus calamus—Calamus oil | — | — | — | — | — | Calamene. | Calamol. |
| Acorus spuriosus—Japanese calamus oil. | | | | | | | |
| *Lilliaceæ.* | | | | | | | |
| Allium sativum—Garlic oil | — | — | — | — | — | ? | |
| *Zingiberaceæ.* | | | | | | | |
| Kaempferia galanga—Oil of — | — | — | — | — | — | ? | |
| Zingiber officinale—Ginger oil. | | | | | | | |
| *Piperaceæ.* | | | | | | | |
| Piper nigrum—Black pepper oil. | | | | | | | |
| Piper cubeba—Cubeb oil | — | — | — | — | — | — | Cubeb camphor. |
| Piper betle—Oil of betel leaves. | | | | | | | |

OCCURRENCE OF SESQUITERPENES IN THE VEGETABLE KINGDOM.—*Continued.*

| | Cadinene. | Caryophyllene. | Humulene. | Santolene. | Zingiberene. | Uncharacterized Sesquiterpenes. | Sesquiterpene Hydrates. |
|---|---|---|---|---|---|---|---|
| *Salicaceæ.* | | | | | | | |
| Populus nigra—Poplar bud oil. | | | | | | | |
| *Moraceæ.* | | | | | | | |
| Humulus lupulus—Hop oil. | | | | | | | |
| Cannabis sativa—Hemp oil. | | | | | | | |
| Cannabis gigantea—Oil of inflorescence. | | | | | | | |
| *Santalaceæ.* | | | | | | | |
| Santalum album—Sandalwood oil | — | — | — | *α* & *β*. | — | — | Santalol. |
| *Magnoliaceæ.* | | | | | | | |
| Drimys winteri—Winter's bark oil | — | — | — | — | — | Winterene. | |
| *Anonaceæ.* | | | | | | | |
| Cananga odorata—Ylang-ylang and cananga oil. | | | | | | | |
| *Monimiaceæ.* | | | | | | | |
| Unknown species—Para coto bark oil. | | | | | | | |
| *Lauraceæ.* | | | | | | | |
| Cinnamomum camphora—Camphor oil. | | | | | | | |
| Nectandra caparrapi—Caparrapi oil | — | — | — | — | — | Caparrapene. | Caparrapiol. |
| Sassafras officinale – Sassafras bark and leaf oil | ? | | | | | | |
| Laurus nobilis—Oil of laurel berries. | | | | | | | |
| *Rosaceæ.* | | | | | | | |
| Spiraea ulmaria—Spiraea oil. | | | | | | | |
| *Leguminosæ.* | | | | | | | |
| Copaifera officinalis and other species—Copaiba balsam oil. | | | | | | | |
| Copaifera species (unknown)—African copaiba balsam oil. | | | | | | | |
| *Zygophyllaceæ.* | | | | | | | |
| Bulnesia sarmienti—Guaiac wood oil | — | — | — | — | — | — | Guajol. |

OCCURRENCE OF SESQUITERPENES IN THE VEGETABLE KINGDOM.—*Continued.*

| | Cadinene. | Caryophyllene. | Humulene. | Santolene. | Zingiberene. | Uncharacterized Sesquiterpenes. | Sesquiterpene Hydrates. |
|---|---|---|---|---|---|---|---|
| *Rutaceæ.* | | | | | | | |
| Cusparia trifoliata—Angustura bark oil | — | — | — | — | — | Galipene. | Galipol. |
| Citrus limonum—Lemon oil. | | | | | | | |
| Citrus bigaradia—Petitgrain oil | ? | | | | | | |
| Amyris balsamifera—West Indian sandalwood oil | — | — | — | — | — | — | Amyrol. |
| *Burseraceæ.* | | | | | | | |
| Commiphora species?—Oil of bisabol myrrh | — | — | — | — | — | Bisabolene. | |
| Bonvellia carterii—Oil of olibanum. | | | | | | | |
| Icica heptaphylla—Conima resin oil | — | — | — | — | — | Conimene. | |
| Bursera aloexylon—Mexican lignaloe oil. | | | | | | | |
| *Meliaceæ.* | | | | | | | |
| Cedrela odorata and other species—Cedrela wood oil. | | | | | | | |
| *Euphorbiaceæ.* | | | | | | | |
| Croton elutria—Cascarilla oil. | | | | | | | |
| *Dipterocarpaceæ.* | | | | | | | |
| Dryobalanops camphora—Borneo camphor oil. | | | | | | | |
| Dipterocarpus species—Minjak Lagam balsam oil. | | | | | | | |
| Dipterocarpus turpinatus and other species—Gurjun balsam oil | — | — | — | — | — | Gurjunene. | |
| *Canellaceæ.* | | | | | | | |
| Canella alba—Canella oil. | | | | | | | |
| *Myrtaceæ.* | | | | | | | |
| Pimenta officinalis—Pimenta oil. | | | | | | | |
| Eugenia caryophyllata—Clove oil. | | | | | | | |
| Eugenia caryophyllata—Clove stem oil | — | ? | | | | | |
| *Araliaceæ.* | | | | | | | |
| Aralia nudicaulis—Oil of wild sarsaparilla | — | — | — | — | — | Araliene. | |

OCCURRENCE OF SESQUITERPENES IN THE VEGETABLE KINGDOM.—*Concluded.*

| | Cadinene. | Caryophyllene. | Humulene. | Santolene. | Zingiberene. | Uncharacterized Sesquiterpenes. | Sesquiterpene Hydrates. |
|---|---|---|---|---|---|---|---|
| *Umbellijeræ.* | | | | | | | |
| Apium graveolens—Oil of celery seed. | | | | | | | |
| Archangelica officinalis—Oil of angelica root. | | | | | | | |
| Ferula asafoetida and other species—Asafetida oil | ? | | | | | | |
| Ferula rubricaulis and other species—Galbanum oil. | | | | | | | |
| *Ericaceæ.* | | | | | | | |
| Ledum palustre—Oil of Labrador tea | — | — | — | — | — | — | Ledum camphor. |
| *Convulvulaceæ.* | | | | | | | |
| Convulvulus scoparius and C. floridus—Rhodium oil | — | — | — | — | — | Rhodiene. | |
| *Labiatæ.* | | | | | | | |
| Lavandula vera—Lavender oil. | | | | | | | |
| Lavandula spica—Spike oil. | | | | | | | |
| Salvia officinalis—Sage oil. | | | | | | | |
| Thymus serphyllum—Oil of wild thyme | — | — | — | — | — | ? | |
| Mentha piperita—Peppermint oil. | | | | | | | |
| Mentha arvensis var. pipercescens—Japanese peppermint oil | — | — | — | — | — | ? | |
| Pogostemon patchouly—Patchouly oil | — | — | — | — | — | — | Patchouly alcohol. |
| Ocimum basilicum—Sweet basil oil | — | — | — | — | — | ? | |
| *Valerianaceæ.* | | | | | | | |
| Valeriana officinalis—Valerian oil. | | | | | | | |
| Valeriana officinalis—var. angustifolia—Kisso oil. | | | | | | | |
| *Compositæ.* | | | | | | | |
| Ageratum conyzoïdes—Oil of herb of —. | | | | | | | |
| Solidago canadensis—Golden rod oil. | | | | | | | |
| Artemesia absinthium—Wormwood oil. | | | | | | | |
| Erechthites hieracifolia—Oil of fireweed. | | | | | | | |
| Carlina acaulis—Oil of root of —. | | | | | | | |
| Atractylis ovata—Oil of — | — | — | — | — | — | — | Atractylol. |

COMPARISON OF THE SEQUITERPENES.

A brief comparison of the more important sesquiterpenes and their derivatives may be given. In the first of the accompanying tables, a comparison of the physical properties of the characterized sesquiterpenes and the melting-points of their derivatives is presented, in order to show the analogy as well as the differences between these hydrocarbons. In the second table a comparison of the more important uncharacterized sesquiterpenes which have received specific names, and also a few of those which are at present only known by the name of the oil from which they are obtained, is likewise presented. These two tables do not comprise all the sesquiterpenes, but include all those of which anything definite is known. Of those presented, it will be noticed that only six are definitely characterized, and three others yield solid hydrochlorides of definite melting-points. The second table serves to show the almost total absence of characterization by the preparation of chemical derivatives. The fact that many of these have received specific names does not indicate that their individuality is established; some of the unnamed sesquiterpenes are, in fact, much better known than many of those which have been named by over-anxious investigators.

Many of these sesquiterpenes will doubtless be found to be identical with one or the other of the better characterized sesquiterpenes, or with each other.

The comparison given in the tables is also useful in pointing out the possibility of such identity. It was such a comparison which suggested the application of the caryophyllene test to the sesquiterpene of pepper oil, with the result that this hydrocarbon has been identified. Such a comparison further indicates, for instance, that araliene and the sesquiterpenes from laurel berry, hemp and valerian oils, may possibly be caryophyllene. Whether this is true or not, can of course only be decided by an actual test, which can now be readily made by applying the nitrosite reaction. The sesquiterpene from carline thistle oil shows some similarity to zingiberene although the properties given are very meagre. Other comparisons might be made, but these suffice to show that much careful experimental work remains to be done before the sesquiterpenes can be considered sufficiently characterized for their detection and identification.

## I. Comparison of the Characterized Sesquiterpenes.

| | l-Cadinene. | | d-Cadinene. Grimal.[2] | Caryophyllene. | | Humulene. Chapman.[4] | Zingiberene. | | Santalenes. | Guerbet.[6] | Cedrene (natural). | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Wallach.[1] | Schreiner. | | Wallach.[3] | Schreiner. | | v. Soden and Rojahn.[5] | Schreiner. | $\alpha$ | $\beta$. | Chapman and Burgess.[7] | Rousset.[8] |
| Boiling point | 274–275° | — | 274–275° | 258–260° | 136–137° (20 Mm.) | 263–266° | 134° (14 Mm.) | 160–161° (32 Mm.) | 252–252.5° | 261–262° | 261–262° | 131–132° (10 Mm.) |
| Specific gravity | .918 (20°) | — | .9212 (15°) | .9085 (15°) | .9030 (20°) | .8977 (20°) | .872 (15°) | .8731 (20°) | .9134 (0°) | .9139 (0°) | .9359 (15°) | — |
| Optical rotation | —98.56° | — | + 47° 55′ | Active. | —8.96° | Inactive. | —69° | —73.38° | —13.98° | —28.55° | —60° | —47° 54′ |
| Index of refraction | 1.50647 | — | 1.5094 | 1.50094 | 1.49976 | 1.5021 | — | 1.49399 | — | — | 1.5015 | — |
| Hydrate | — | — | — | 96° | — | Not cryst. | — | — | — | — | — | — |
| Hydrochloride | 117–118° | 117–118° | 117–118° | Liquid. | 69–70° | Liquid. | Liquid. | 168–169° | Liquid. | Liquid. | — | — |
| Hydrobromide | 124–125° | — | 124–125° | Liquid. | — | — | Liquid. | — | — | — | — | — |
| Nitrosochloride | — | 93–94° | — | 161–163° | 157–159° | 164–165° | — | 96–97° | 122° | 152° 106° | — | — |
| Nitrosate | — | 105–110° | — | 148–149° | 148–149° | 162–163° | — | 86–88° | — | — | — | — |
| Nitrosite | — | — | — | — | 113° | 120–121° | — | 97–98° | — | — | — | — |
| Nitrosite $\alpha$-compound | — | — | — | — | 112–114° | 165–168° | — | — | — | — | — | — |
| Nitrosite $\beta$-compound | — | — | — | — | 146–148° | — | — | — | — | — | — | — |
| Nitrol piperidine | — | — | — | 141–143° | — | 153° | — | — | 108–109° | 101° 104–105° | — | — |
| Nitrol benzylamine | — | — | — | — | $\alpha$=167° $\beta$=128° | 136° | — | — | — | — | — | — |

[1] Ann., 238, p. 82.
[2] Compt. rend., 135, p. 1057.
[3] Ann., 271, p. 285; 279, p. 391.
[4] Journ. Chem. Soc., 67, pp. 54, 780.
[5] Pharm. Ztg., 45, p. 447.
[6] Bull. Soc. Chim. (3), 23, pp. 218, 540.
[7] Chem. News, 74, p. 95.
[8] Bull. Soc. Chim. (3), 17, p. 4.

## II. Comparison of the More Important Uncharacterized Sesquiterpenes.

| | Araliene. Alpers.[1] | Calamene. Kurbaton.[2] | Caparrapene. Tapia.[3] | Clovene. Wallach.[4] | Galipene (nat.). Beckurts & Troeger.[5] | Guajene. Wallach & Tuttle.[6] | Gurjunene. Heine & Co.[7] | Ledene. Rizza.[8] | Patchoulene. Wallach & Tuttle.[6] | Winterene. Arata & Canzonaria.[9] | Bisabolene. Tucholka.[10] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Boiling point ..... | 270° | 255–258° | 240–260° | 261–263° | 255–260° | 124–128° (13 mm.) | — | 264° | 254–256° | 260–265° | 259–260.3° |
| Specific gravity. .... | .9086 (20°) | .942 (0°) | .9019 (16°) | .930 (18°) | .912 (19°) | .910 (20°) | .920 | .9349 (0°) | .939 (25°) | — | .8914 (17°) |
| Optical rotation. .... | —7 to —8° | — | —2.21° | — | — | — | —136° | — | — | — | — |
| Index of refraction .. | 1 49936 | — | 1.4953 | 1.50066 | 1.50513 | 1.50114 | — | — | 1.50094 | 1.4931 | 1.4608 |
| Hydrochloride .. ... | — | — | 83° (?) | — | — | — | — | — | — | — | 79.3° |

| | From Hemp Oil. | | From Caroline Thistle. Semmler.[13] | From Cascarilla Oil. Fendler.[14] | | From Citronella Oil. Schimmel & Co.[15] | | From Laurel Berries. Blas.[16] | From Pimenta Oil. Oeser.[17] | From Valerian Oil. Olivier.[18] | From Minjak Lagam Balsam Oil. Haussner.[19] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Valente.[11] | Vignolo.[12] | | Light. | Heavy. | Light. | Heavy. | | | | |
| Boiling point ..... | 256–258° | 256° | 250–253° | 255–257° | 260–265° | 157° (15 mm.) | 170–172° (16 mm.) | 250° | 255° | 160–165° (50 mm.) | 249–251° |
| Specific gravity. .... | .9289 (0°) | .807 (15.3°) | .8733 (22.8°) | .911 (20°) | .924 (25°) | .8643 (15°) | .912 (15°) | .925 (15°) | .98 (8°) | — | .923 |
| Optical rotation..... | —10.81° | laevo— | — | +23.49° | +7.36° | +1° 28′ | +5° 50′ | —7.23° | —0.49° | —9.20° | —9.90° |
| Index of refraction .. | — | — | — | — | — | 1.51849 | — | — | — | — | — |
| Hydrochloride. ..... | solid | liquid | — | — | — | — | — | — | — | — | 114° |

[1] Amer. Journ. Pharm., 71, p. 390.
[2] Ann., 173, p. 4.
[3] Bull. Soc. Chim. (3), 19, p. 638.
[4] Ann., 271, p. 294.
[5] Arch d. Pharm., 236, p. 408.
[6] Ann., 279, p. 396.
[7] Products exhibited at Paris 1900, p. 38.
[8] Ber., 20, Ref., p. 562.
[9] Fahresb. d. Pharm., 1889, p. 70.
[10] Arch. d. Pharm., 235, p. 292.
[11] Ber., 13, p. 2431; 14, p. 1717.
[12] Ber., 27, Ref., p. 406.
[13] Chem. Ztg., 13, p. 1158.
[14] Arch d. Pharm., 238, p. 671.
[15] Ber. S. & Co., Oct., 1899, p. 12.
[16] Ann., 134, p. 1.
[17] Ann., 131, p. 277.
[18] Bull. Soc. Chim. (3), 13, p. 924.
[19] Arch. d. Pharm., 221, p. 245.

## CLASSIFICATION OF THE SESQUITERPENES.

In an earlier article * the position of the sesquiterpenes, $C_{15}H_{24}$, in the various systems of classification of the hydrocarbons of the general formula ($C_5H_8$) was given. It was also pointed out that the systems proposed for the classification of the sesquiterpenes were entirely inadequate in the light of recent observations. There was presented a system for their classification which was based broadly on the best classification of hydrocarbons in general. The sesquiterpenes, $C_{15}H_{24}$, were considered under the formula of saturation $C_nH_{2n-6}$, and since there are eight unsaturated carbon affinities in this formula, there must be four double bonds or their equivalents in the molecule. It was there pointed out that the equivalence of a double bond is a cycle, and applying this principle to the formula of saturation $C_nH_{2n-6}$, it becomes evident that the following groups of compounds must result:

I. Chain compounds with four double bonds.
II. Monocyclic compounds with three double bonds.
III. Dicyclic compounds with two double bonds.
IV. Tricyclic compounds with one double bond.
V. Tetracyclic compounds with no double bond.

The further subdivisions of the last four groups were there styled "nuclear types," depending upon the number of members in the cycle or cycles. These considerations gave us a very extensive system of classification of the sesquiterpenes. Based on the formula of saturation it includes every possible compound of the formula $C_{15}H_{24}$, from a tetracyclic to a chain compound, and every possible nuclear structure.

The theoretical discussion of the formula $C_{15}H_{24}$, referred to above, shows that the sesquiterpenes offer a large field for chemical research. Although the knowledge of this class of hydrocarbons is still in its infancy, the experimental facts already indicate the probable existence of representatives of four out of the five possible groups. The apparent existence of isomers in this class of compounds, varying from tricyclic to chain compounds, offers a field for investigation, which for breadth is possibly not duplicated by any other class of isomeric hydrocarbons.

In the accompanying table those sesquiterpenes, of which both the specific gravity and index of refraction have been determined, so as to make the calculation of the molecular refraction possible, are given. The santalenes are also included, because the chemical properties and specific gravity indicate the group to which they belong. It is to be remembered that in only a few cases has the sesquiterpene under consideration been of reasonable purity, and the physical constants are therefore not absolutely accurate. Moreover, some of the sesquiterpenes given may in future be found to be identical with one or the other of the better characterized sesquiterpenes.

* Pharm. Archives, 4, p. 141; Proc. Amer. Pharm. Assoc., 1901, p. 329.

CLASSIFICATION OF THE SESQUITERPENES INTO GROUPS.

| Group. | Sesquiterpene. | Sp. Gr. | Molecular Refraction. | |
|---|---|---|---|---|
| | | | Found. | Calculated. |
| Tetracyclic. | — | — | — | 62.74 |
| Tricyclic. | Cedrene | 0.936 | 64.13 | 64.45 |
| | Clovene | 0.930 | 64.77 | |
| | Patchoulene | 0.939 | 64.02 | |
| Dicyclic. | Araliene | 0.909 | 65.82 | 66.15 |
| | Cadinene | 0.918 | 65.93 | |
| | Caparrapene | 0.902 | 65.85 | |
| | Caryophyllene | 0.903 | 66.27 | |
| | Galipene | 0.912 | 66.22 | |
| | Guajene | 0.910 | 65.92 | |
| | Humulene | 0.898 | 66.93 | |
| | $\alpha$-Santalene | 0.913 | — | |
| | $\beta$-Santalene | 0.914 | — | |
| Monocyclic. | Bisabolene | 0.891 | 67.35 | 67.86 |
| | Zingiberene | 0.873 | 67.87 | |
| Chain. | from Citronella oil | 0.864 | 71.43 | 69.57 |

The arrangement of the table shows at once that the sesquiterpenes fall into groups, both as to their specific gravities and especially their molecular refractions. The results are clearly in harmony with the Landolt-Brühl theory of the influence of double bonds on the molecular refraction, a marked deviation from the exact quantitative relation being found only in the case of the sesquiterpene from citronella oil of rather uncertain purity.

In this classification the specific gravity is likewise of great importance, the rule being that the more unsaturated the sesquiterpene the lower its specific gravity. It is thus seen that the specific gravity alone will at least indicate the proper class to which the sesquiterpene belongs.

Another property that seems to vary with the constitution of the sesquiterpene is the dispersion, although the data at hand are too meagre to more than merely indicate a difference in dispersive power.

Below are given some of the characteristics of the various groups of sesquiterpenes, together with a brief discussion of the members belonging to each.

The *tetracyclic* group. The members of this group, containing no double bonds, will be difficult to attack experimentally at the present state of our knowledge. They cannot form halogen or hydrohalogen addition

products, nor yield nitroso addition products without suffering a break in the cycle. They may yield substitution products, and thus be brought into the realm of experimental chemical research. No members of this group are known, although it is possible that some of the heavy sesquiterpenes, which apparently do not react with nitrosyl chloride, may belong to this group.

The *tricyclic* group. The members of this group have a comparatively high specific gravity, ranging from 0.930 to 0.939. The cedrene isolated from cedarwood oil by Rousset and the clovene obtained by Wallach from caryophyllene hydrate, by treatment with phosphorus pentoxide, in all probability belong to this group. Patchoulene, obtained by dehydration from patchouly alcohol, is also a member of the tricyclic group.

The *dicyclic* group. This group has a number of representatives, and promises to be by far the largest group. The specific gravities of the members of this group fall between the limits 0.898 and 0.918. Cadinene undoubtedly belongs to it, as is shown by its molecular refraction, formation of a dihydrochloride and general chemical behavior. Caryophyllene also belongs to this group, as is definitely shown by recent chemical and optical work. Kanonnikow,* however, reaches a different conclusion in regard to both of these hydrocarbons, which ought to be briefly mentioned here.

Kanonnikow applies the true density of bodies to the determination of constitutional differences. According to the dielectric theory of Clausius-Mosotti, when the dielectric constant (according to the electro-magnetic theory of light) is replaced by the square of the index of refraction, $n^2$, that part of the entire volume which is occupied by the molecules only, becomes $V = \frac{n^2-1}{n^2+2}$. From this the true density becomes $D = \frac{d}{V} = \frac{n^2+2}{n^2-1} d$, where d is the usual density. Kanonnikow has found by calculating the product *MD* for the hydrocarbons the following empirical formula:

$$(MD) = 39.7n + (2n \pm m)H - 4H + a.\ 9H - b.\ 6H - b^1.\ 26H - C.\ 4H.$$

in which *n* is the number of carbon atoms, $2n \pm m$ the number of hydrogen atoms, *a* the number of cycles, *b* the number of ethylene bonds, $b^1$ the number of naphthalene-ethylene bonds, and *c* the number of acetylene bonds. *H* is equal to 0.967. By means of this empirical formula, Kanonnikow finds that cadinene and caryophyllene have three cycles and one ethylene bond, in contradiction to the optical and chemical results obtained with these hydrocarbons.

The molecular refraction of humulene, although slightly high, together with the formation of a liquid hydrochloride, which appears to be a di-derivative, place it in this group. The index of refraction of the santalenes

* [Journ. russ. phys.-chem. Ges., 31, p. 573; Chem. Centralbl., 1899, II, p. 858.]

had not been determined by Guerbet, but the formation of liquid di-hydrochlorides, and the general chemical behavior, as well as the specific gravity, indicate their relationship with the members of the dicyclic group. The specific gravities and molecular refraction of the uncharacterized sesquiterpenes, araliene, caparrapene, galipene and guajene, indicate two double bonds.

The *monocyclic* group. The members of this group show a much lower specific gravity than those of the tricyclic and dicyclic groups. Bisabolene and zingiberene probably belong to this group. If bisabolene is a sesquiterpene as its high boiling point would seem to indicate, then it must belong to this group, for its physical constants and formation of a trihydrochloride leave no doubt of the presence of three double bonds. The low specific gravity and molecular refraction of zingiberene speak for three double bonds, but its chemical derivatives so far prepared are not in harmony with this conclusion. The reason why the optical method is considered the more trustworthy in this case has already been given.*

The sesquiterpene found in the oil of carline thistle by Semmler, if not identical with zingiberene, belongs at least in the same group with it.

The synthetic benzol derivatives of the formula $C_{15}H_{24}$ belong in this class. These are the 1–methyl–4–isopropyl–2–isoamyl benzene prepared by Claus,† and the 4–octyl–1–methyl benzene prepared by Lipinski.‡ The constitution of these two compounds being known, they can be assigned to the proper nuclear type.

The *chain* group. A possible representative of this group is found in the sesquiterpene isolated by the chemists of Schimmel & Co. from citronella oil. The sesquiterpene has a specific gravity which is even lower than that of zingiberene, and when it is considered that it has been separated from methyl eugenol, having a specific gravity of 1.047, this low specific gravity is significant. The general chemical behavior is in harmony with the view that it is a chain compound. Its molecular refraction, as already mentioned, is rather high.

This brief presentation of the possible members of the various groups, while still rather indefinite, nevertheless shows that among the sesquiterpenes there are compounds possessing widely different properties, which are doubtless due to some such constitutional differences as those suggested above for their classification.

DISCUSSION OF POSSIBLE CONSTITUTION AND SYNTHESIS OF SESQUITERPENES.

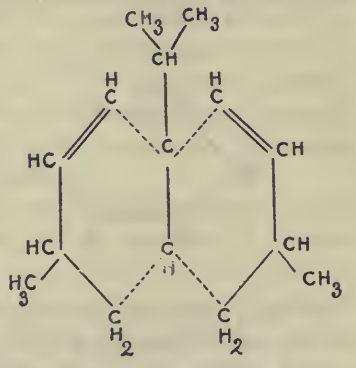
In connection with this classification, based on constitutional differences, it will not be amiss to consider briefly the possibility of ascertaining the

* Proc. Amer. Pharm. Assoc., 1901, p. 329.

† Journ. f. prakt. Chem., (2), 46, p. 489.

‡ Ber., 31, p. 940.

constitution of these hydrocarbons, both by "Abbau" and by synthesis. Several attempts have been made to synthesize sesquiterpenes. In 1867 Reboul* succeeded in polymerizing valeriene with conc. sulphuric acid, obtaining as one of the products a hydrocarbon $C_{15}H_{24}$, trivaleriene (See this under synthetic sesquiterpenes). A similar result was obtained by Bouchardat† in 1878. Wallach,‡ in 1887, attempted to prepare cadinene dihydrochloride from the polymerization products of pinene, but failed. Thinking that cadinene might be produced by polymerizing a pentene rather than a terpene, he tried various methods of polymerization on isoprene, $C_5H_8$. Although he obtained a hydrocarbon boiling between 260–280°, he was unable to prepare a solid dihydrochloride from the compound. In a later article Wallach § suggests several formulas for terpenes, and one for a sesquiterpene. These formulas are based on the supposition that these hydrocarbons are, in part, at least, polymerization products of a pentene. The sesquiterpene he considers as resulting from the polymerization of three molecules of isoprene, as shown by the accompanying formula.



Sesquiterpene.

Of this formula Wallach remarks: "Bei einem derartigen Aufbau würden den Sesquiterpenen und (wie man leicht findet) auch den Polyterpenen je zwei doppelte Kohlenstoffverbindungen zukommen, was den bisher bekannten Thatsachen entspricht." After the exposition of the possibilities of isomeric hydrocarbons $C_{15}H_{24}$ in the preceding section it is well nigh needless to call attention to the fact that the above statement is altogether too narrow a view, and is not even supported by the facts now recorded of well-characterized sesquitrepenes.

The syntheses of the benzene derivatives of the formula $C_{15}H_{24}$ by Claus‖ and by Lipinski¶ are of interest, as they furnish us with sesquiterpenes of known constitution, but they do not agree with any of the natural sesquiterpenes, which probably have some cycle or cycles other than that of benzene in their nuclear structure.

Another line of synthesis for sesquiterpenes is suggested by recent work with cyclo-methyl hexanone. Thus Dorrance** was able to get from two

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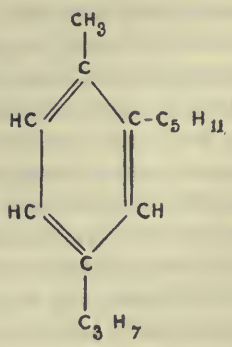
* Compt. rend., 87, p. 419; Ann., 143, p. 373.

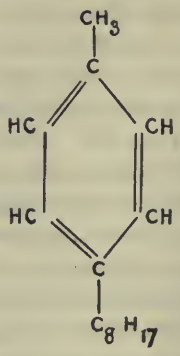
† Compt. rend., 87, p. 654; Bull. Soc. chim, 33, p. 24. ‡ Ann., 238, p. 88.

§ Ann., 239, p. 49.

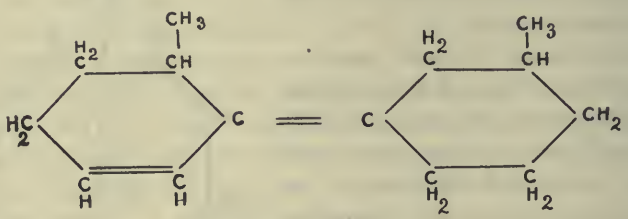
‖ Journ. f. prakt. Chem. (2), 46, p. 489. ¶ Ber., 31, p. 940.

** Dissert. Göttingen, 1897.




molecules of cyclo-methyl hexanone $C_7H_{12}O$ by a series of reactions, the hydrocarbon $C_{14}H_{22}$, to which he assigns the formula :




By using one molecule of cyclo-methyl hexanone and one molecule of a cyclo-ethyl hexanone or cyclo-dimethyl hexanone, it ought to be possible to obtain a hydrocarbon $C_{15}H_{24}$, namely, a sesquiterpene.

While such synthesis would furnish us with sesquiterpenes of known constitution, it is questionable whether they would agree with any of the the known natural sesquiterpenes. The problem of the constitution of these compounds is a difficult one. It will probably have to be solved by methods of oxidation and hydrolysis, that is a breaking-down of the complex structures into simpler compounds, the constitution of which may be known or more readily determined. The oxidation of the sesquiterpenes has been but little studied, and that little offers no clue as to the nuclear structure of any of them. If zingiberene is monocyclic, it ought to be much simpler to work on it than the members of the dicyclic group. Direct oxidation with permanganate or dichromate yields very unsatisfactory results, but anhydrous copper sulphate seems to be more favorable in its action. Some preliminary experiments show that zingiberene is very readily oxidized by this oxidizing agent with the formation of an oily body, the nature of which has not been determined.

*University of Wisconsin, Madison, Wis.*

# PHENACETIN.*

## History, Patent, Methods of Manufacture and Chemical Constitution.

BY LYMAN F. KEBLER, CHIEF OF DRUG LABORATORY.

[Contribution from the Bureau of Chemistry, U. S. Department of Agriculture, No. 3.]

On reviewing the history of phenacetin it soon becomes apparent that, like many other useful discoveries, it was not the achievement of a single individual, or of a certain time, but was gradually evolved by the successive efforts of many minds, stimulated by the progress of correlated branches of science. It was, however, due to the patient efforts of O. Hinsberg and those he associated with himself, that the product of this article on a commercial scale and its great medicinal value became known to the world.

The germ of phenacetin was sown by the celebrated French chemist, A. Cahours, during the course of a series of valuable investigations, extending over a number of years. In 1843† appeared his "Recherches sur l'huile de Gaultheria procumbens," which was persistently followed up until 1849,‡ when he announced the discovery of phenetol ($C_6H_5OC_2H_5$, phenyl ethyl ether), mononitrophenetol ($C_6H_4NO_2OC_2H_5$) and phenetidin ($C_{14}H_9NO_2C_2H_2$, old nomenclature). Two methods for preparing phenetol were given, one by heating together ethyl salicylate and baryta, and the other by simply heating barium ethyl salicylate.

Following up a suggestion of Cahours, G. Baly,§ at the request of A. W. Hofmann, prepared phenetol by the first method described above, but called it "Salithol." Baly presented his work to the London Chemical Society, December 4, 1848, but it did not appear in the society's official organ until 1850. It is interesting to note in this connection that several foreign journals printed the article in 1849, giving the Quart. J. Chem. credit for an article that did not appear in its columns for nearly a year afterwards.

In 1851 Cahours‖ prepared phenetol by heating together, in a sealed tube, from 100° to 120° C., potassium phenolate and ethyl iodide. The following year appeared C. Gerhardt's¶ classic "Recherches sur les Acides Organiques Anhydres." In this investigation we find prepared for the first time acetanilid and benzanilid, by the action of acetic anhydride and benzoic anhydride, respectively, on aniline. This same worker** had

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* See footnote on p. 195.

† 1843, Comp. rend., *16*, 853; J. prakt. Chem., *29*, 197.

‡ 1849, Ann. chim. phys., (3), *27*, 439; 1850, J. prakt. Chem., *49*, 262; Ann. (Liebig), *74*, 314.

§ 1850, Quart. J. Chem. Soc., *2*, 28; 1849, J. prakt. Chem., *47*, 419.

‖ 1851, Comp. rend., *32*, 60; Ann. (Liebig), *78*, 225.

¶ 1852, Comp. rend., *34*, 755; J. prakt. Chem., *56*, 321.

** 1845, Comp. rend., *20*, 1031.

made benzanilid seven years before by the interaction of benzoyl chloride and aniline.

In 1854 J. Fritzsche began to study the action of nitric acid on phenol. His first results were presented to the St. Petersburg Academy of Sciences, November 6, 1857.* In this communication he reported the preparation of ortho-nitrophenetol by the action of ethyl-iodide on a silver salt of ortho-nitrophenol. The ester was extracted and purified by treating the mixture with ether, evaporating the solvent, and distilling the resulting reddish-yellow fluid. The product thus produced was nearly odorless, almost insoluble in water, but readily soluble in alcohol and ether. Boiling caustic potash solution decomposed it with difficulty.

The following year † the same worker discovered and described isonitrophenic acid (para-nitrophenol) and some of its derivatives. The derivative of particular interest in this connection is its ethyl ester, para-nitrophenetol, prepared as was the ortho-nitrophenetol above. Para-nitrophenetol he described as a colorless, crystalline body, possessing an agreeable odor, nearly insoluble in water, soluble in ether and alcohol, and melting at 57° to 58° C.

Nothing of importance appeared again until A. Groll ‡ announced the preparation of ortho-amidophenetol from ortho-nitrophenetol. The latter was prepared by dissolving potassium nitrophenolate and ethyl bromide in from 3 to 4 parts of alcohol and heating the mixture for a number of hours in a sealed tube, from 140° to 160° C. Ortho-amidophenetol was made by treating ortho-nitrophenetol with metallic tin and hydrochloric acid. From this time forward the nitrophenetols were well known to organic chemists, being frequently employed by them in their research work and probably in the industrial world. Para-nitrophenetol was used by R. Schmitt and R. Möhlau § in their investigation on Azoxy-Azo and Hydrazophenetol; by Schmitt ‖ during his study of the constitution of the dichlorazophenols, and R. Möhlau ¶ in his dissertation very fully describes ortho-nitrophenetol. The latter in his study of ortho diamidodiphenetol** fully sets forth that the phenetols were common property.

By allowing fuming nitric acid to act on phenetol, Cahours†† obtained

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* 1858, St. Petersb., Bull. Classe phys. math., *16*, 161; J. prakt. Chem., *73*, 293; Chem. Centralb. (2), *3*, 171.

† 1859, St. Petersb. Bull. Classe phys. math., *17*, 145; J. prakt. Chem., *75*, 257; Ann. (Liebig), *110*, 155; Jahresb., *11*, 407.

‡ 1875, J. prakt. Chem. (2), *12*, 207.

§ 1878, J. prakt. Chem. (2), *18*, 198.

‖ 1879, J. prakt. Chem. (2), *19*, 312.

¶ 1879, Dissertation, Freiburg, i, b. 27 ff.

** J. prakt. Chem. (2), *19*, 381.

†† 1849, Ann. chim. Phys., (3), *37*, 465.

a solid and a liquid body, the former he called dinitrophenetol, and the latter mononitrophenetol. E. J. Hallock* repeated these experiments and obtained two similar bodies. He said, "The solid, when purified by repeated recrystallizations, both from acid and from alcohol, was proved by an ultimate analysis to be a mononitrophenetol. Its melting point, 58° C., and other physical properties coincide with that of para-mononitrophenetol, prepared by Fritzsche in 1858 by the action of iodide of ethyl upon the silver salt of para-nitrophenol."

H. Andreæ,† in his excellent communication on Nitro-ortho- and Nitro-para-azophenetol, shows that he was well acquainted with both the para- and the ortho-nitrophenetol. C. Willgerodt‡ gave a new method for preparing para-nitrophenetol as indicated by the following equation: $C_6H_4(NO_2)Cl + C_2H_5OH = C_6H_4(NO_2)OC_2H_5 + HCl$. H. Kolbe§ gave additional methods for preparing these products. Other useful papers published bearing on these products were contributed by J. Berlinerblau;‖ C. Liebermann and St. Kostanecki;¶ and C. Willgerodt and M. Ferko.**

The next step involved in the production of the phenacetins is the conversion of the nitrophenetols into the amidophenetols. This is usually done by the well-known nascent-hydrogen process.

*Ortho-amidophenetol* was first given to the world by A. Groll†† in 1875. The same compound was produced by M. Förster,‡‡ in 1880, and by J. Berlinerblau,§§ in 1884. *Meta-amidophenetol* was well-known to Berlinerblau,§§ Ph. Wagner,‖‖ and undoubtedly to other organic chemists in the early eighties. The discovery of *para-amidophenetol* is generally credited to the American chemist, E. J. Hallock,¶¶ but R. Schmitt's*** work on the constitution of the dichlorazophenols shows that chemists were well acquainted with this compound before the publication of Hallock's article. It was well-known to Liebermann and Kostanecki††† in 1884.

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* 1879, Am. Chem. J., *1*, 271.

† 1880, J. prakt. Chem., (2), *21*, 318.

‡ 1881, Ber. d. chem. Ges., *14*, 2636; 1882, Ber. d. chem. Ges., *15*, 1002.

§ 1883, J. prakt. Chem., (2), *27*, 424; *Ibid.*, (2), *28*, 62.

‖ 1884, J. prakt. Chem., (2), *30*, 97.

¶ 1884, Ber. d. chem. Ges., *17*, 876.

** 1886, J. prakt. Chem., (2), *33*, 152.

†† 1875, J. prakt. Chem., (2), *12*, 207.

‡‡ 1880, J. prakt. Chem., (2), *21*, 341.

§§ 1884, J. prakt. Chem., (2), *30*, 97.

‖‖ 1885, J. prakt. Chem., (2), *32*, 70.

¶¶ 1879, Am. Chem, J., *1*, 271.

*** 1879, J. prakt. Chem., (2), *19*, 312.

††† 1884, Ber. d. chem. Ges., *17*, 376.

The process described in the phenacetin patent 1889 for the manufacture of para-phenetidin was old and well-known prior to the date of the alleged invention. Substantially the same method was described in 1884 by H. Köhler.*

Meta-acetphenetidin, or the meta variety of phenacetin, was prepared by Ph. Wagner† in 1885. This he accomplished by gently heating together two parts of meta-phenetidin and one part of acetic anhydride, cooling the resulting mixture, transferring the cooled crystalline mass to a funnel, washing out part of the impurities by means of water, and finally recrystallizing from hot water. The purified glistening crystals were white, with a tint of red, melted at 96.7° C. (uncorrected), and were difficultly soluble in water.

After having prepared para-amidophenetol, Hallock‡ experimented further with this compound and reported one observation in the following words: "This oil combines, like aniline, directly with acetyl chloride to a crystalline solid." *This crystalline solid* for the greater part undoubtedly consisted of para-acetphenetidin or phenacetin proper. Hallock, however, did not isolate the crystalline body and establish its physical properties and chemical composition. If he had done this it would have been a positive anticipation of the patent, and that part of the patent alleging novelty, or "a new pharmaceutical product," would have had its mainstay undermined. He left all information about the crystalline body vague and inconclusive. He evidently did not think that it possessed any value or was worth farther investigation. His statement that he obtained a *crystalline body* by the interaction of acetyl chloride and para-amidophenetol was not useful to the public.

The great desideratum of the medical profession has been a safe, effective and inexpensive antipyretic. The oldest and best febrifuge at this time (1880) was quinine sulphate, but, on account of its costliness, many efforts had been made by chemists to prepare either quinine artificially or find an efficient substitute. In 1842 Gerhardt§ distilled a mixture of quinine, water and caustic potash, and obtained a useful base, which he called quinolin. Its high price forbade its use medicinally. By treating cinchonine in the same manner, he produced the same base, but named it chinolin (quinoline). He was very much encouraged by the results of this investigation, for it was found that this comparatively cheap base and its salts were active antipyretics. Quinoline tartrate was the earliest largely-used artificial febrifuge. Quinoline itself was used as a nucleus of many synthetic antipyretics or quinine substitutes. The successful preparation

* 1884, J. prakt. Chem., (2), *29*, 257.

† 1885, J. prakt. Chem., (2), *32*, 70.

‡ 1879, Am. Chem. J., *1*, 271.

§ 1842, Ann. (Liebig), *42*, 310; J. prakt. Chem., *28*, 65.

of synthetic quinine has been reported from time to time, but at this writing has not been accomplished.

Stimulated by the success of Gerhardt, K. Hlasiwetz and L. Barth * distilled resins in the same manner that quinine and cinchonine had been, and obtained a product which they called *resorcin*. This chemical was at first extolled as an antipyretic also.

From 1862 to 1879 there appeared to be a cessation of activities in the field of the above class of remedies, but at the latter date W. Königs † gave a new impetus to this line of work by his researches on quinoline, making it synthetically on a large scale from aniline. He was soon joined in his investigations by Baeyer, Skraup, Fischer, Knorr, Körner, etc., with very fruitful results.

Drs. Fischer and Königs, in their studies on the alkaloids, came to the conclusion that the properties of quinine did not reside in the quinolin nucleus, but in an oxygen- or hydrogen-bearing element contained in or introduced into the nucleus. With this in mind their researches were prosecuted, and a number of the new bodies were discovered, only two of which, however, appeared to be successful as medicinal agents. These were oxyhydro-methylquinoline hydrochloride, prepared by O. Fischer,‡ and called "Kairin," and quinoline methylhydride, made by L. Hoffmann and W. Königs,§ and named "Kairolin." The former was patented, highly extolled, extensively advertised, and seems to have been the first medicinal chemical that was stimulated by the mercantile influence of letters patent.

In 1884 L. Knorr ‖ succeeded in preparing another very efficient antipyretic, and named it antipyrine. It is well covered by patents. In France, however, a patent was granted only on a process for manufacturing it as an aniline product. But antipyrine did not possess any industrial value; could not be sold as a patented remedy, for France holds the interests of suffering humanity above the interest of the inventor, consequently does not grant patents on medicinal agents. The result was that antipyrine was not employed openly in France during the life of the patent.

Acetanilid was discovered in 1852,¶ by C. Gerhardt, but its antipyretic properties were not revealed until 1886, by G. Krieger.** It is well known by its trade name, "Antifebrin." This compound, unfortunately, is prone to induce collapse when frequently administered in large doses. It was

* 1864, Wien. akad. Ber., *49*, 203; through Chem. Centralb., *9*, 806.

† 1879, Ber. d. chem. Ges., *12*, 453.

‡ 1883, Ber. d. chem. Ges., *16*, 712; Arch. der Pharm. (3), *21*, 61.

§ 1883, Ber. d. chem. Ges., *16*, 727.

‖ 1884, Ber. d. chem. Ges., *17*, 2032; J. Soc. Chem. Ind., *4*, 59.

¶ 1852, Comp. rend., *34*, 755.

** 1886, Centralb., f. klin. Med, *7*, 761.

shown twenty years previous to this time by C. D. Schroff,* A. Crum-Brown and T. R. Fraser, † and more recently by Stolnikow,‡ that a modification of the chemical constitution of a chemical compound materially changes its physiological action. For example, the introduction of a methoxy group into morphine, converting it into codeine, materially diminishes its narcotic action.

Salol was prepared by M. Nencki,§ and investigated therapeutically by Dr. Sahli.‖ This chemical was fully covered by patents.

In 1887 phenacetin as an antipyretic first made its public appearance through communications by G. Kobler¶ and E. Ghillany.** This chemical was prepared by Hinsberg. No unfavorable after-symptoms were noticed in fifty cases that were treated. C. Hinsberg and A. Kast †† reported that para-acetphenetedin (phenacetin), in doses of three grams, acted like a strong poison, but in doses from 0.2 to 0.5 grams, exhibited to feverish persons, it was an effective antipyretic.

E. Utescher reported phenacetin ‡‡ as a very reliable antipyretic, and singularly free from secondary effects. He described it as an odorless, tasteless, white (pinkish tint), crystalline body, having a melting-point of 132.5 C. When heated with sulphuric acid, ethyl acetate is produced. On heating a mixture of phenacetin, potassium hydroxide solution and chloroform, the isonitrile odor is developed. Phenacetin heated with a potassium hydroxide solution liberates ethyl alcohol, which, on the addition of iodine, gives iodoform. This phenacetin was manufactured by F. Bayer & Co.

The above historical review quite fully sets forth the state of the art and knowledge prior to the application for the phenacetin patent, June 29, 1888. The various methods for making acetanilid and its physiological action were well known. Acetanilid produced unfavorable after-results when given in repeated large doses. Certain undesirable physiological actions had been removed or modified, or mitigated by the introduction of certain well-known groups. Phenacetin has the same chemical constitution as acetanilid, excepting that one of the atoms of hydrogen of acetanilid has been substituted by an ethoxy group.

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* 1866, Wochenblatt, d. K. K. Ges. Aerzte, Wien, *6*, 157.

† 1869, Trans. Royal Soc. Edin., 25, 151 and 693; J. Anatomy & Physiol. (2), *2*, 478.

‡ 1884, Ztschr f. Physiol. Chem., *8*, 236.

§ 1886, Polytech. Notizbl., *41*, 176; through Chem. Centralb. (3), *17*, 751.

‖ 1887, Therap. Monatsh. Berl., *1*, 333.

¶ 1887, Ztschr. österr. Apoth. Ver., *25*, 323.

** 1887, Ztschr. österr. Apoth. Ver., *25*, 339; J. Soc. Chem. Ind., *6*, 676.

†† 1887, Centralb. Med. Wissensch, *25*, 145.

‡‡ 1887, Apoth. Ztg., *2*, 436; through J. Chem. Soc. Ind., *7*, 227.

# PHENACETIN PATENT.

UNITED STATES PATENT OFFICE.

OSCAR HINSBERG, OF BARMEN, ASSIGNOR TO THE FARBENFABRIKEN, VORMALS FR. BAYER & CO., OF ELBERFIELD, GERMANY.

## PHENACETIN.

Specifications forming part of letters patent No. 400,086, dated March 26, 1889. Application filed June 29, 1888. Serial No. 278,593. (Specimens.)

*To all whom it may concern:*

Be it known that I, Oscar Hinsberg, a citizen of the Empire of Germany, residing at Barmen, in the said Empire, have invented a Useful Improvement in the Manufacture of a New Pharmaceutical Product, of which the following is a specification:

My invention relates to the production of a new pharmaceutical product, a new antipyretic and anti-neuralgic, obtained by reducing nitrophenetole and melting the phenetidinchlorhydrate thus formed with dried sodium acetate and acetic acid.

In carrying out my process practically I proceed as follows: Fifty kilos of the potassium salt of paranitrophenole are mixed with three hundred kilos of alcohol, adding forty kilos of bromaethyl. The mixture is heated in an autoclave at a pressure of three to four atmospheres during about eight hours. At this time the reaction is finished whereby para-nitrophenetole is obtained according to the following equations:

$$C_6H_4\begin{cases}ONO\\NO_2\end{cases} + C_2H_5Br = C_6H_4\begin{cases}OC_2H_5\\NO_2\end{cases} + BrNa$$

In order to separate the mononitrophenole, which has not taken any part in the process from the ether recently formed, the solution is treated with steam. By this operation the ether distills, leaving behind the para-mononitrophenole.

For the reduction of the para-nitrophenetole forty kilos of this ether are mixed with sixty kilos of muriatic acid and sixty kilos of water. To this mixture are gradually added, at a temperature of 70° centigrade, twenty-five kilos of iron filings, the whole being stirred continually. As soon as the ether is entirely reduced, para-amidophenetole is obtained, as explained by the following equation:

$$C_6H_4\begin{cases}OC_2H_5\\NO_2\end{cases} + H_6 = C_6H_4\begin{cases}OC_2H_5\\NH_2\end{cases} + 2H_2O$$

The solution obtained in this manner is saturated with chalk diluted with water, and for the purification of the amido compound treated with steam, the distillate is absorbed in water acidulated by muriatic acid. The muriatic salt of the para-amidophenetole crystallizes in white leaves. Fifty kilos of this product are melted with one molecule of melted acetate of sodium and twenty four kilos of glacial acetic acid. The melted mass is repeatedly boiled with water, and the new monoacetylparamidophenetole obtained from the filtration after cooling. It has the following chemical formula:

$$\text{Para } C_6H_4\begin{cases}NH(C_2H_3O)\\OC_2H_5\end{cases} = C_{10}O_2H_{13}N$$

And is obtained according to the following equations:

$$\text{Para } C_6H_4\begin{cases}NH_2\\OC_2H_5\end{cases} + CH_3COOH = C_6H_4\begin{cases}NHC_2H_3O\\OC_2H_5\end{cases} + H_2O$$

The monocetylparamidophenetole crystallizes in white leaves, melting at 133° to 136° centigrade. It is tasteless, little soluble in cold water, more so in hot water, but easily in alcohol, chloroform, benzole, etc. It is altogether different from the body described in the "Year Book of Pharmacy," 1883, page 146, denominated "Phenacetëine." The formula of phenacetëine is $C_{10}H_{12}O$, that of phenacetine $C_{10}H_{18}O_2N$, my product containing nitrogen contrary to phenacetëine. The phenacetëine represents a coloring matter an amorphous carmine-red powder, the acid solution of which is yellow, the alkaline raspberry-red, while my phenacetine is colorless, crystallizing in white leaves, not changing in color by addition of acids or alkalies.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The product herein described, which has the following characteristics: it crystallizes in white leaves, melting at 135° centigrade, not coloring on addition of acids or alkalies; is little soluble in cold water, more so in hot water; easily soluble in alcohol, ether, chloroform or benzoles; is without taste, and has the general composition $C_{10}H_{13}O_2N$.

O. HINSBERG.

Witnesses: WM. DIESTEL, O. J. HEIMPEL.

On reading the above patent, it will be observed that the descriptive portion is for a process, while the claim is solely for the product. In an attack on the validity of the patent the patentee took shelter behind this claim, alleging that the invention resided in the product and not in the process. Their admissions on examination, however, are inconsistent with this position. The patentee undoubtedly knew that there was nothing new in the process described, and it was a shrewd move on the part of his attorney to draft the patent in such a manner as to permit the above construction. There is nothing new in the process. Every step was well known to chemists long prior to the time of application for the patent. The only useful improvement in the process was its application on a commercial scale, and there could be little hope of successfully defending such a process in case of an attack. The claim for the product seems to be quite safe, for there is nothing available in ordinary chemical literature that conclusively anticipated the patent. The "crystalline solid" of Hallock, spoken of above, was undoubtedly impure phenacetin, but his information concerning the product was not sufficient anticipation, in the opinion of the courts, to invalidate a useful patent.

The patent has been declared good and valid in law by the United States Circuit Court* of the Eastern District of Pennsylvania, and the United States Circuit Court of Appeals† for the third circuit affirmed the decision of the lower court. O. Hinsberg must, therefore, at present be considered the acknowledged discoverer of phenacetin, and should be entitled to any emoluments that might accrue as the result of his labors.

Phenacetin is an eminently efficient medicinal remedy, and is, consequently, largely used in all parts of the civilized world. It is open to competition in every country except the United States.

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* 1901, Fed. Rept., 108, 233. † 1902, Fed. Rept., 113, 870.

In the "Defendant's Statement of Facts Proven," presented in litigation of the phenacetin patent, is found the following: "Neither the product nor the process described in the patent in suit has been patented in any other country in the world except the United States."

The pharmaceutical profession has chafed considerably for many years under the foreign yoke, which our present patent laws permit to be adjusted. In many cases the phenacetin burden became unbearable, and the illegitimate product was resorted to. This phenacetin was formerly largely smuggled into our country from the Canadian borders. At present it is mostly brought in by unauthorized agents through the customs duty paid, and delivered to the trade at about half the price charged by the holders of the patent. Much of this smuggled phenacetin bears the same label as the authorized product, but it is expressly stated on the carton that "The resale and importation to the United States of America is prohibited." It is sometimes called "peddled" phenacetin. In some cases the dealers in these goods are not satisfied with their profits, but mix phenatecin with acetanelid, and put it up in spurious packages closely resembling the original cartons. Adulterated phenacetin has brought much unpleasantness to the druggists of this country.

For a time it was thought that phenacetin could be handled in this country under its chemical name, para-acetphenetidin, as was "Dermatol" (bismuth subgallate), "Antifebrin" (acetanelid), "Antipyrine" (dimethyl-oxychinizin), and is at present "Aristol" (dithymolanite-iodide), but it appears that this name is also controlled. Whatever may be the *status quo*, it is quite evident that very little para-acetphenetidin, as such, finds its way into the United States except such as is brought in surreptitiously.

The words "Phenacetin" and "Phenacetin-Bayer" are protected by United States registered trademarks, numbers 18637 and 16392, respectively. If the usual customs should prevail, the owners of these trademarks would have the exclusive right to use these words for thirty years from the date of registration, but, according to certain recent decisions,* the word "phenacetin" becomes public property at the expiration of the phenacetin patent, otherwise it would be necessary to use the chemical name or coin a suitable one for common use, as was the case with Vaseline, known in the United States Pharmacopœia as Petrolatum.

The following interesting extract is taken from the Singer decision: "Trade-Mark—Doctrine as to Use of Name Given to Patented Article After Expiration of Patent. It is the universal American, English and French doctrine that where, during the life of a monopoly created by a patent, a name, whether it be arbitrary or be that of the inventor, has be-

* 1896, Decis. U. S. Courts, page 687, Singer Manufacturing Company *v.* June Manufacturing Company.

1901, Decis. U. S. Courts, page 500, The Holzapfle's Composition Company, Limited, *v.* The Rahtjen's American Composition Company.

come, by the consent, either express or tacit, the identifying and generic name of the thing patented, this name passes to the public with the cessation of the monopoly which the patent created."

"Same, same—Use of Name to Deceive. Where another avails himself of this public dedication to take the machine and use the generic designation, he can do so in full forms, with the fullest liberty, by affixing such name to the machines, by referring to it in advertisements, and by any other means, subject, however, to the condition that the name must be so used as not to deprive others of their rights or to deceive the public, and, therefore, that the name must be accompanied with such identifications that the thing manufactured is the work of the one making it as will unmistakably inform the public of that fact." On the principles embodied in the above decision the trade-marked names Antipyrine, Castoria and Lanolin have become public property. Any one is at liberty to manufacture the above articles, with the restriction that the public must not be deceived as to the maker.

The underlying principle of our patent laws is to stimulate and protect invention. Some think the phenacetin patent is an unjust grant, and is not in harmony with the spirit of our patent laws. A product patent which is so construed as to cover the chemical name removes every stimulus to produce the article by a more economical process. Every inventor of a process for the preparation of a patented product is at the mercy of the owner of the original patent. He is in a position to dictate terms to the inventor of the new process. The latter has no redress. It is generally admitted that our patent laws do work hardships in a few cases like phenacetin, but if they were modified so as to remedy such difficulties, much greater ones would become involved. Again, there appears to be ample evidence that if the patent did not cover the name of the product, not sufficient protection would be extended to the inventor, and many useful inventions would never become known to the world. Notwithstanding these inequalities, we are told by those who are in a position to know, that our patent laws are the best in the world.

The commission appointed by President McKinley to revise the United States patent and trademark laws did not see its way clear to make the changes desired by the American Pharmaceutical Association. There was certainly ample evidence to show that the request was a reasonable one. On the presumption that our laws are made for the benefit of our citizens, it seems strange that the recommendations were ignored. Foreigners ought certainly not to be given letters patent in this country for their products which their own countries will not protect in a similar manner. The commission has been criticised harshly for its course, but it must be remembered that of the large number of patents granted in the United States, chemical and medicinal remedies constitute only a small percentage. It would mean special (class) legislation for a comparatively few

articles, which Congress is very much disinclined to enact, for experience has shown that the results are frequently far from satisfactory. All useful laws necessarily work some hardships. The way is apparently not clear to discontinue giving chemical patents at present. It is certainly feasible, however, to compel the patented article to be manufactured in this country within a reasonable time after the patent is granted, and continued during the life of the patent. Something should be done to deter foreigners from unduly harassing our citizens.

### METHODS OF MANUFACTURE.

The method described in the patent does not need to be considered farther. The following equations serve to illustrate the successive steps and the principles involved in the manufacture of phenacetin:

| | | | | | | |
|---|---|---|---|---|---|---|
| $C_6H_4NO_2OH$ | + | 6H | = | $C_6H_4NH_2OH$ | + | $2H_2O$ |
| p–nitrophenol | + | nascent hydrogen | = | p–amidophenol | + | water. |

| | | | | | | |
|---|---|---|---|---|---|---|
| $C_6H_4NH_2OH$ | + | $C_2H_5Br$ | = | $C_6H_4NH_2.OC_2H_5$ | + | HBr |
| p–amidophenol | + | ethyl bromide | = | p–amidophenetol or p–phenetidin | + | hydrobromic acid |

| | | | | | | |
|---|---|---|---|---|---|---|
| $C_6H_4NH_2OC_2H_5$ | + | $CH_3COOH$ | = | $C_6H_4NH.C_2H_3O.OC_2H_5$ | + | $H_2O$ |
| p–phenetidin | + | glacial acetic acid | = | phenacetin | + | water |

Acetic anhydride or acetyl chloride can be used in place of glacial acetic acid. Phenacetin is obtained pure by recrystallization from hot water. In 1885 J. D. Riedel* took out a German patent for the manufacture of p–amidophenetol, which is the direct antecedent of phenacetin, by reducing 10 kgs. of diethyldioxyazobenzene with six kgs. of tin and fifty kgs. of 20 per cent. hydrochloric acid. As soon as the diethyldioxyazobenzene is dissolved, the mixture is rendered alkaline and submitted to distillation. Para-amidophenetol is carried over with the aqueous distillate. The patenteé states that this chemical is serviceable in preparing phenacetin. The reaction is represented by the following equation:

$$C_2H_5O.C_6H_4N{=}NC_6H_4.OC_2H_5 + 4H = 2C_2H_5O.C_6H_4NH_2$$

According to another method,† 50 grams of chrysophenin, 100 grams of zinc-dust and 225 Cc. of hot water are mixed in a 2-liter flask and heated on a water-bath, with frequent agitation, for one hour, then submitted to distillation. The p amidophenetol is removed from the distillate by means of ether, the ethereal solution rendered acid with 30 Cc. of dilute hydrochloric acid, which converts the phenetol into an ether insoluble hydrochloride. The ether is drawn off and the aqueous solution concentrated to crystallization.

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* D. R. Patent, No. 48,543, Dec. 28, 1888.

† 1894, Bender und Erdmann, Organische Präparate, *2*, 466.

H. N. Morse* in 1878 treated p-amidophenol with acetic acid, with the expectation of getting an acetic acid salt of p-amidophenol, but obtained p-acetylamidophenol. In 1892 E. Taüber† secured letters patent in Germany for a process that converts this chemical into phenacetin. The method is as follows: Mix 150 grams of p-acetamidophenol, 165 grams of potassium ethyl sulphate, 40 grams of sodium hydrate (dissolved in 500 Cc. of 60-per cent. alcohol), in an autoclave, and heat the mixture for four hours at 150° C. On diluting the resulting solution with three parts of water, phenacetin crystals separate out in fairly pure crystals. This appears to be the method now used in the manufacture of phenacetin.

CONSTITUTION OF PHENACETIN.

The chemical constitution of phenacetin can readily be made out from what has been said above. Its chemical names are, p-acetaminophenol ethyl ether, p-acetphenetidin, p-acetamidophenetol, ethoxyacetanilid and oxyethylacetanilid. The latter name shows its close relation to acetanilid. This is shown by the following formula:

$$C_6H_5NHC_2H_3O \text{ (acetanilid) and } C_6H_4{<}\begin{matrix}NHC_2H_3O\\OC_2H_5\end{matrix} \text{ (phenacetin).}$$

These two compounds resemble each other not only in chemical constitution, but also in their physical properties.

THE CHAIRMAN: Gentlemen, the next order of business is the installation of officers, but before proceeding to this I wish again to thank the members of this Association for the manner in which they have supported the Chairman in his work. I would like to say that last year, when the meeting in Philadelphia was over, I heard a number make the comment that the meeting at Mackinac would be pretty slim after the glorious meeting at Philadelphia, and I confess I thought we would have a rather slim showing for the Scientific Section; but I sent out communications to some twenty-five of those who are accustomed to contribute, and when I tell you I have just received paper No. 39 you must conclude that the response has been very cordial. Again I thank you, gentlemen.

The Chair then asked Mr. Dohme and Mr. Good to be a committee of escort to conduct the newly-elected Chairman to the stand. These gentlemen brought Mr. Puckner forward, and Mr. Dohme said:

Mr. Chairman, I have the pleasure of introducing Mr. Puckner, the newly-elected Chairman of the Section.

Chairman Schlotterbeck then said:

Members of the Scientific Section, it gives me pleasure to introduce Mr. W. A. Puckner, who is well known to you, and who, I am sure, will give you great satisfaction as your Chairman. [Applause.]

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* 1878, Ber. d. chem. Ges., *11*, 232.

† D. R. Patent No. 85, 988.

Mr. Puckner, acknowledging the introduction, said :

Gentlemen, I thank you for the honor conferred on me. I can only say that what I may lack in ability I will try to make up in the earnestness of my efforts for the success of the next meeting. [Applause.]

Mr. Puckner then took the chair, and asked Mr. Caspari and Mr. Whelpley to conduct the new Secretary to the front. These gentlemen performed that duty, and Mr. Whelpley said :

Mr. Chairman, I introduce to you, and through you to the members of the Section, Mr. Eustace H. Gane, the Secretary elected by the Section for the ensuing year. [Applause.]

THE CHAIRMAN: Mr. Gane, I trust that our relations may be cordial throughout. Gentlemen of the Section, I introduce to you your new Secretary.

MR. GANE: Mr. Chairman, I beg to thank the members for the honor conferred on me, and will continue to be interested in the work of the Section and the Association. [Applause.]

The Chair asked if there was any new business to come before the Section, but there was no response.

Mr. Kremers made an announcement as to a meeting of the American Conference of Pharmaceutical Faculties to-morrow afternoon.

Mr. Kebler stated that frequently inquiries had come to him relative to the possibility of securing the Government publications, which he said it was possible for individuals to secure along certain lines, and that if those who desired the publications of the Drug Laboratory would send their names to the laboratory they would be placed on file, and the publications sent them gratis. [Applause.]

On motion of Mr. Mayo, the Scientific Section then stood adjourned finally.

# MINUTES

OF THE

# SECTION ON PRACTICAL PHARMACY AND DISPENSING.

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FIRST SESSION—THURSDAY MORNING, AUGUST 6, 1903.

The Section was called to order by Chairman Beringer at 10:30 a. m., and Mr. Lowe was called to the Chair while Mr. Beringer read the following address:

## CHAIRMAN'S ADDRESS.

"THE CRY OF SUBSTITUTION."

Custom has provided a place on the programme for the address of the Chairman of the Section on Practical Pharmacy and Dispensing. While, at times, this custom is more honored in the breach than in the observance, your Chairman believes that, on the present occasion, duty demands that he should avail himself of this privilege. The homely lines of Lowell impress me:

> "For the day never comes when it'll do
> To kick off duty like a worn-out shoe."

Instead of directing your attention to a number of the important subjects worthy of consideration by the practical pharmacists of the twentieth century, I have decided to concentrate my energies and present in as forceful a way as possible but one topic that appears to me to be of vital importance to every dispenser.

In inviting your attention to "the cry of substitution" that has been promulgated throughout the country, permit me to say that the issue is thrust upon us. We cannot sidetrack it, and it would be suicidal to ignore the "danger signals," or to meet the issue in any other way than in a manly, frank, honorable and dignified professional spirit, seeking to obtain the light of truth and the eradication of all evil practices from pharmacy.

The writer has no foe to punish or friend to reward, and conceding that "truth is violated by falsehood and may be equally outraged by silence," will present the result of his own investigations without any sugar coating. There is no place more appropriate for the deliberate consideration of this subject than the meeting of this Section of an organization whose membership has always striven to maintain the honor and integrity of the profession of pharmacy.

The calling of the pharmacist is elevated above that of merchandizing largely by the

confidence imposed in him by his customers. A confidence that entrusts him with their lives and the lives of those whom they love, and his professional standing and financial success must be largely dependent upon the extent to which he maintains this confidential relation. Deprive him of this professional confidence, and his special education can do but little to prevent his sinking to the ordinary level of such tradesmen as the hatter and the cobbler. We must not underestimate the danger to pharmacy from publications and statements that tend to undermine and destroy the confidence of the public, but must guard our honorable calling, and jealously defend it against such unjust attacks.

The newspapers of the previous generation were wont to publish funny stories and jokes at the expense of the druggist, and we enjoyed these good-natured hits and joined in the laugh and passed them by. Threadbare and stale now are the jokes relating to the profits and humerous experiences of the druggist. The former, the public knows, vanished with the era of cut prices, and the latter are no longer worthy of place in the columns of an up-to-date newspaper.

Sensationalism is a marked characteristic of modern journalism, and in the search for suitable material the drug trade has been made the butt for a number of attacks. These attacks have become more bold, harsh and even virulent with each renewal, and in some of these, at least, I suspect that the newspapers have been "taken in" by some designing persons.

Some two or three years ago there appeared in the news columns of a number of the daily papers short paragraphs inveighing against substitutors. Their similarity and other ear-marks pointed to "set-copy," and in one case they were traced to an advertising agency which placed the advertisements for certain prominent proprietary medicines. The copy was sent to the local papers with the request for publication, and the suggestion "that it would be to the interest of the paper to spare the space." It has since become quite a stereotyped fad for proprietary medicines, with little or no sale, to raise the cry of substitution, and it is being extensively introduced in the advertisements in the medical journals.

More recently the satire of the cartoonist was invoked, and the substituting druggist has been represented as an inmate of Hades begging for water to cool his parched tongue and Satan offering him "something else just as good."

The cartoon published in the New York Evening Journal in July, 1902, entitled "Substitution, or What's the Difference," compared the druggist who offered "something else just as good" to a pickpocket. This called forth a vigorous protest from the Executive Committee of the National Association of Retail Druggists, but which was unfortunately addressed to the wrong party. The effect of such publications cannot fail to be injurious to the pharmacists. Is it not rather significant that a reprint of this vulgar cartoon, and the article accompanying it, was distributed by mail by a certain manufacturing firm in St. Louis? This same firm, incredible as it may seem, has successfully marketed a simple mixture of well-known chemicals, imposing upon the credulity of the medical profession by misleading and involved sentences implying that their preparation was a newly discovered synthetic possessing special medicinal value. Is it not apropos to enquire if the shoe does not fit the big "cuss," the big swindler, as well as the little one? Also, was this cartoon and article published by request, and has the newspaper been made a cat's paw?

The most injurious occurrence, however, was the unfortunate publication by the New York Board of Health of a report of its examinations of phenacetin sold in that city. In the report covering the examination of this one chemical only occurs the following broad statement: "The adulteration and substitution of drugs is believed to be widespread and flagrant, and is an evil which is a decided menace to life and health." This model example of sophistry was construed as an indictment of the drug trade, and several of the metropolitan newspapers have found it ample material for sensational editorials and very

unfair and unjust inferences. Under glaring captions the public are advised of "The Great Frauds in the Drug Business." They are told what wicked and dangerous men are the dispensers of drugs, that "the business is honeycombed with fraud," and that "this kind of thing is going on all the time in the drug business." Under the bold title of "Substitution in the Drug Business," one editorial repeats that "the trade is tainted with fraud," and then exposing his ignorance of the honest efforts of the American Pharmaceutical Association, as well as those of other organizations of pharmacists, to expose and prevent fraud this editor adds, "that any movement to reform abuses so profitable as those found in the substitution of cheap and inferior preparations will be initiated by the druggists, is scarcely within the range of probability."

These ridiculous and libellous statements of the New York dailies have been accepted as a cue by the numerous newspapers throughout the country, and the religious and literary contemporaries have joined their cackle. Not to be left off the band wagon, one of our honored professional authorities publicly claimed the glory of having directed the attention of the Board of Health to the subject, and aknowledged that "it affords him great satisfaction to note the wide publicity given to the subject of adulterated drugs and chemicals." As the daily newspapers can never be made the arbiters of such questions, would it not have been more consistent for a member of the Committee on the Revision of the Pharmacopœia to have advised his duped humble brother pharmacists, through the proper channels, of his knowledge of such frauds and the method of detecting them?

The charge has been made that the New York Board of Health was either led into a trap or knowingly assisted in advertising a monopolized patent medicine. While I cannot believe that this has any foundation in fact, nevertheless quite naturally the manufacturer has taken advantage of this extensive advertising, and has distributed his copies in all directions and, unwittingly, perhaps, a number of wholesale druggists have lent their assistance to his promulgation of the cry of substitution. These agencies have conspired to place upon the drug trade the stigma of dishonest practices.

The wide publicity of what must go down to history as the "Phenacetin Scandal," has done the pharmacists of America an incalculable amount of injury. It will be almost impossible to convince the public that the 315 accused pharmacists of New York City were not intentional sophisticators, and that the same proportion of all the druggists are not rascals. They are likewise led to believe that the druggists are very generally adulterating their products, as the Christian Advocate editorially puts it: "The worst of it is that it will be impossible to believe that any of these druggists would be adulterating in only one line."

Appreciating the importance of the subject to the members of this Association desiring to obtain the truth in the matter direct and officially, I addressed the Department of Health of New York, requesting information as to the correctness of the report. In a very courteous reply the acting secretary confirmed the newspaper reports.

Dr. J. A. Deghuee, the chemist of the department, also kindly answered my inquiries, and advised that all the samples were plainly labeled phenacetin, and enclosed in envelopes, each bearing the name and address of the druggist from whom the sample was was purchased. The tests relied on for detecting acetanilid were melting point, absence of precipitate on adding bromine water to the solution, and the production of the odor of phenyl carbamine. "No sample was reported as adulterated unless it responded to all tests." In the absence of duplicate samples for an independent examination no one can dispute the correctness of his work and statement.

Desiring further information as to the character of the phenacetin dispensed throughout the country, I decided to make a personal and independent investigation of as many samples as possible. A summary of this examination of 182 samples collected from various sections of the country, shows that 148 were pure, 27 were grossly adulterated, and seven (7) but slightly contaminated.

It must be frankly admitted there is now on the market an unusual amount of sophisticated phenacetin, and that the druggists of America must be on their guard, and that every means of detecting such fraud should be placed at their command.

The query arises, who is responsible for this condition? And who are the adulterators?

In considering the first of these theories, we cannot exonerate the owners of the American patent on this product, but must hold them primarily to blame. They have taken advantage of a construction of our patent laws that could never have been intended by the enactors, and have unjustly discriminated against the American druggist, compelling him to pay the fictitious price of $1.00 per ounce for an article that they are supplying to the druggists of other countries at 25 cents per ounce. In their fatherland these manufacturers enjoy no such special privilege, such an excellent and continuous opportunity of posing as modern Shylocks, and surely no American Congress ever intended to place the suffering of the country and those who supplied their wants, in a position where a foreign manufacturer could hold them up and unmercifully pick their pockets. Such a condition necessarily evokes resistance from the victim who is being choked.

If, instead of giving this exhibition of legalized looting, they had treated the pharmacists of the United States honorably, and supplied their wants on the same terms that they supply our Canadian brethren of the pestle, there would have been no need to seek underground channels of supply. In no other country, and no other trade, would the dealers supinely submit to such injustice, and the time is more than ripe for the pharmacists of America to exert themselves and demand such a modification of our laws that shall for all time prevent such exhibitions of extortion.

The apothecaries of Germany have the privilege of purchasing any one of the several manufactures of phenacetin, and I submit that *neither by legal enactment nor by pharmacopœial definition should the pharmacists of the United States be restricted to the use of only one manufacture of any product when there are several all answering the requirements and tests for purity.*

Who are the adulterators? The authorities point to the retailers who are caught selling the adulterated drug, and by legal actions and through the medium of the newspapers, tell the public that these are the guilty rascals who are diluting and adulterating their wares. Most of the accused druggists in New York, and more recently those in Washington, claimed that they were not guilty of intentional wrong-doing, but simply sold an article which they had purchased as pure, and which until legal action was taken against them, they had presumed was so.

Let us look fairly and honestly at the position of the accused in this contention, and accord to them the same "fair play" that even newspapers contend should be accorded to the worst criminals. Are there not some extenuating circumstances and certain peculiar conditions associated with this whole contention which will compel us to accept their plea as truthful and justify a verdict in their favor.

An established law of political economy accords to every dealer the right to buy in the cheapest market and sell in the dearest, and the manufacturer who is not slow to take advantage of the latter clause should acknowledge the right of the retailer to the privilege of the former. If in the exercise of this inherent right, the retailer has been deceived and has palmed off on him an impure article, he becomes a victim of the crime and not the criminal. As such he deserves our sympathy and not public condemnation.

Is the merchant who receives, in the course of his business a counterfeit note, and unknowingly passes it, a criminal? Would any official of the law, any newspaper, claim that he was the counterfeiter? Then, why in the name of decency is not the same fairness displayed toward the druggist who is duped by a counterfeit?

The argument is advanced that the druggist should be able to discriminate between the genuine and the counterfeit. This is an ideal condition, but quite as untenable as

the proposition that a bank must not be deceived by counterfeit money. Yet we know that skillfully executed counterfeits have not only passed through the hands of expert bankers, but even found their way into the very vaults of the government.

It must not be forgotten that phenacetin is a chemical product which, from its very nature can never be prepared by druggists, and he must always depend for his supply upon large manufacturers and intermediate handlers.

Also, that it is not yet recognized by the United States Pharmacopœia, and that official tests are not at his command, and, moreover, that some of the tests actually proposed for its recognition and the detection of adulterants are fallacious and misleading. Is there any wonder that these druggists, who are not experts in this line, should be deceived.

No trade has ever been entirely demoralized, and the membership of no profession can be in the large majority corrupt. The very figures reported, namely 315 inculpated out of 373 should have indicated to unbiased officials that there was some other explanation than dishonesty, and editors, who are supposed to have had some experience with men and affairs, should have recognized the necessity for more guarded language and inferences. Of course, we perceive that the "pious editor's creed" is still the same.

> "That we're the original friends o' the nation,
> All the rest air a paltry and base fabrication."

In their zeal these officials unhesitatingly published the names of 315 druggists as dealers in adulterated drugs, and saw no need for caution ere they assailed the most reputable.

> "The purest treasure mortal times afford,
> Is spotless reputation; that away,
> Men are but gilded loam or painted clay."

Their hasty and uncalled-for action affected not only the reputation and business career of these supposedly reputable citizens, but has had a degrading effect upon the entire profession of pharmacy. Their duty as conservators of the public health certainly did not demand this unwise wholesale defamation of character and menace to an honorable profession. "Truth is established by investigation and delay, falsehood prospers by precipitancy." A continuance of such extravagant and sensational crusades must undermine and threaten the very existence of professional pharmacy.

The writer must not be construed as condoning in the least degree adulteration or substitution in any form. These very words are abhorrent to every intelligent pharmacist, and those guilty of such practices are false alike to moral and professional duty, and degrade not only themselves, but in a measure, the entire profession, as the public frequently fails to discriminate between the honest and the dishonest druggist. That a few dishonest men are really engaged in the drug business must be admitted, but that their proportion is greater than that following any other calling we most emphatically deny. For such we have no defence or apology to offer. They no doubt deserve all the punishment that is meted unto them. The actual compounders of such adulterations assist in their exposure and conviction.

In this age of patent-medicine competition and the difficulty of eking out an existence, no doubt here and there a druggist has attempted to fight fire with fire and has foolishly used this boomerang argument of "just as good."

In conclusion permit me to inquire what is the duty of the American Pharmaceutical Association in these premises? The Association that stands for the profession and ethics of pharmacy should most positively place its stamp of disapproval upon all forms of substitution, and with equal positiveness against sensational and uncalled-for attacks and unseemly advertisements reflecting upon the morality and standing of the pharmacists as a body.

As individual members, let us remember that eternal vigilance is necessary to guard our professional and business probity. If you have been guilty of offering your customers anything "just as good" cease ere your prestige is gone by some unfortunate error. If your own preparations are no better than those of the patent-medicine man, cease at once making them. If they are superior, as they should be, then give them the most prominent display in your store and advertisements. But make them sell on their own merits, in an honorable, business-like competition, and in every sale give your customer what he or she is entitled to, conscientious service, and just what is called for.

The address of the Chairman was received with applause, and Mr. Mayo, seconded by Mr. Gable, moved to accept and adopt.

MR. LAMPA: Mr. Chairman, the very able paper submitted by Mr. Beringer, seems to me to be particularly timely. I have been present at various meetings, and have been surprised to hear so much said about substitution. It seems to me it comes with bad grace from the American Pharmaceutical Association, because it is helping the process which grinds us all into pulp. We listened the other day to the cry of substitution, and the statement was made that it was true—that the reason the physician had such great distrust in what the pharmacist provided was due to the fact that he could not find any medicine that would produce the effect that he wanted. Now, any practical pharmacist knows that the reason of this distrust (?) is not found in the fact that the pharmacist gives goods which are not what they are supposed to be, but is due to the fact that the medical profession wants the *dollar* that properly belongs to the pharmacist! [Cries of "Hear, Hear."] Do you know there are houses in this country that put up preparations, such as hypophosphites and other preparations, in four-ounce bottles, and send them to physicians throughout the United States, with a prescription blank attached, on which they can write the dose? If there is any distrust, I am sure its cause is rather to be found in other directions, and not from the possibility that the physician will receive medicines from the pharmacist which are not efficient and not according to the Pharmacopœia. I think the sooner the American Phamaceutical Association drops this discussion about substitution the better it will be for the Association and the better it will be for every individual druggist that is practicing his profession. Now Mr. Beringer, in his paper, has ably set forth the attempts made to discredit the pharmacist, and it is lamentable—wofully lamentable—that the men in our own profession are the ones that help the movement along. The time has come to call a halt. I say this with all seriousness, the time has come to call a halt on the subject of substitution by the pharmacist, because there was never a time when the pharmacist could get just what he wanted, just the class of of goods that he wanted, like the present. The higher class of goods the druggist can get, and everything else that he will pay for. It is a reflection on the pharmacist to say that he is not capable of distinguishing between the qualities of goods. If he cannot do so he had better get out of the pharmaceutical profession. So I say, let it remain with the pharmacist to determine what is right or wrong. A little while ago I heard that the American Pharmaceutical Association was organized for the purpose of protecting the public. Do not delude yourselves for a moment, gentlemen. I hold that the American Pharmaceutical Association is organized for the protection of American Pharmacy. All the other interests are looking out for themselves, and if the American Pharmaceutical Association will look out for our interests, then, and only then, will the pharmacist attain the meed that properly belongs to him. I assure you, from what I have gathered at these meetings, that the pharmacist needs greater consideration than the public, because if he gets the consideration he deserves the public will be sure to be benefited by it. [Applause.]

Mr. Mayo's motion to accept and adopt the paper was then put to a vote and carried.

Mr. Beringer resumed the Chair.

The Chair stated that the reports of the committees were now in order, and said that the Committee on National Formulary had asked that their report be postponed until the afternoon session, and that, without objec- the request would be granted. The Chair then went on to state that this would seem to be the proper time to take some action regarding the appointment of a Committee on Prizes; that Dr. Enno Sander, of St. Louis, had offered to this Section a prize of $50 for the best paper, or collection of papers, submitted at this meeting, and he would suggest that a committee be appointed now to take the papers submitted under consideration, and report at the next session.

Thereupon Mr. Mayo moved that the Section officers and their associates be constituted a Committee on Prizes, as he understood that had been the custom in the past.

THE CHAIRMAN: I do not know that I entirely agree with Mr. Mayo on that point. No contributor of a paper should be on the committee, and some of the officers of the Section are contributors of papers. I think a special committee of three should be appointed.

Mr. Mayo said he would change his motion then, to the effect that the Chair be authorized to appoint a committee of three for this purpose.

This motion was seconded by Mr. Bartells, and carried.

The Chair said he would appoint on the committee Mr. W. C. Kirschgessner, Mr. L. C. Hopp, and Mr. Charles Holzhauer. Mr. Kirschgessner asked to be excused, and the Chair indicated Mr. E. M. Boring in his stead, but Mr. Boring also begged to decline. Mr. Leo Eliel was then placed on the committee to serve with Mr. Hopp and Mr. Holzhauer.

The Chair stated that if there were no other committees ready to report at this time the reading of papers would be taken up, and called on Mr. W. H. Burke, Secretary of the Section, to read a paper on Permanent Syrup of Hydriodic Acid, in the absence of the author, Mr. Raubenheimer. Mr. Burke presented the paper, calling attention to some samples of the preparation discussed, sent for exhibition.

## PERMANENT SYRUP OF HYDRIODIC ACID.

BY OTTO RAUBENHEIMER, PH. G.

I have made several improvements since my last article on this subject was published.*

The following is my present formula: Potassium iodide, 16.6 Gm.; potassium hypophosphite, 0.5 Gm.; glycerin, 125.0 Cc.; distilled water,

* Deutsch-Amerikan Apoth. Zeitg. XI, March 15, 1889; Pharm. Era, May, 1889, fol. 186; Am. Druggist, June, 1889, 101; Proc. A. Ph. A., Vol. 37, 1889, 407.

50.0 Cc. Dissolve in a 250 Cc. prescription bottle and add to it the following solution: Acid tartaric, 15.0 Gm.; alcohol dilut., 50.0 Cc. Mix and put on ice or in ice water for 2–3 hours. Meanwhile, prepare, in either hot or cold way, a syrup of white rock candy, 500.0 Gm., distilled water sufficient to make 700.0 Cc. Strain through flannel. If prepared warm, then the syrup must be cooled. Into this syrup, by means of a long stem and covered glass funnel, and a white filter-paper, filter the solution of hydriodic acid, being careful to disturb the precipitated potassium bitartrate as little as possible in the bottom of the prescription vial. After all the liquid is filtered, put 25 Cc. of distilled water into the prescription bottle, shake well, and pour into the filter. When the liquid is all filtered, then remove the filter and add sufficient distilled water to make 1,000 Cc. Next add a heaping teaspoonful of purified coarse animal charcoal to the syrup, shake well, and set aside for one or two days, shaking occasionally. Then filter the syrup through a white filter-paper in a covered glass funnel, and it is finished, and will keep.

The specific gravity of a syrup thus prepared is 1.25 (15° C.) 100 Cc. of my syrup contains 1.28 Gm. absolute HI; 100 Gm., 1.03 Gm.

I claim the following advantages for my syrup:

1. It requires no evaporation of the acid solution (as in the U. S. P. process). There is no question that the less you expose this solution to the air, the better and more permanent your syrup will turn out.

2. The glycerin added to the solution of potassium iodide before the hydriodic acid is formed will preserve the solution and syrup. I have made numerous experiments, and added glycerin to the solution and to the syrup *after* the hydriodic acid had been formed, and found that the finished syrup will not remain white.

3. By filtering the solution of hydriodic acid in a long-stem, covered funnel, dipping below the surface of the syrup, the solution is prevented from coming in contact with air.

4. I use pure white rock candy in place of ordinary sugar, which always contains ultramarine, Prussian blue and tin chloride. The latter chemical, I am informed by sugar chemists, is added in process of manufacturing to bleach the sugar.

5. I digest the syrup of hydriodic acid with a little animal charcoal to completely decolorize it. I also find this the proper thing to decolorize old syrup which has assumed a yellow or orange color.

6. In order to filter the finished syrup rapidly, I prefer to make it of a sp. gr. 1.25. Gardner's well-known syrup only has sp. gr. 1.16.

THE CHAIRMAN: Gentlemen, the paper is before the Section for discussion and action.

Mr. Ebert moved to receive and refer for publication.

MR. EBERT: Mr. Chairman, there are two alleged facts in that paper that, in my

opinion, are fallacious. While it is true that rock candy is pure sucrose, yet this same purity is obtainable in cut, crushed or granulated cane sugar of the market. It is only a question of paying a price for it, which is much less, however, than that of rock candy. Regarding the presence of tin salts in the cane sugar of the market, I question if the same can be found. It might have been possible some thirty or forty years ago, when salts of tin were used in bleaching raw-sugar solutions, but I do not believe they are employed at present, the refining of sugar being nearly altogether confined to the use of bone-black. Secondly, the use of bone-black or animal charcoal by the writer of the paper, in his process for this syrup, seems to me very unnecessary, and certainly very objectionable, as the passing of the acid solution through the animal charcoal introduces into the finished syrup of the hydriodic acid foreign substances extracted from the bone-black that it should not contain.

MR. RYAN: I would like to ask a question here in reference to syrup of hydriodic acid, and have an expression of opinion from this Section. Is it permissible to make syrup of hydriodic acid, using no sugar whatever and only using glycerin as the diluent and yet call it syrup of hydriodic acid.

THE CHARMAN: The Chair is of the opinion that when so made it should not be called a syrup, but a glycerole of hydriodic acid probably.

MR. RYAN: I agree with the Chair entirely, and I should expect this Section to agree with both of us; but if any one has a contrary opinion I should like to hear it, because I know it is commonly done.

THE CHAIRMAN: Does Mr. Ryan mean to imply that some persons are substituting glycerin entirely for sugar in the syrup?

MR. RYAN: Yes, sir; entirely.

THE CHAIRMAN: Is that done by the use of the so-called concentrated hydriodic acid solution?

MR. RYAN: No, sir; simply the ordinary hydriodic acid, containing nothing but glycerin as the diluent. Now, is this thing admissible? I think it should be called a glycerole, and sold as such.

MR. ELIEL: I object to this change entirely, for another reason besides the reasons stated by Mr. Ebert, and that is, that it does not comply with the official formula. The official formula, as I remember it, does not contain any glycerin. Now, I think if we are careful to follow the directions of the U. S. Pharmacopœia, and careful in the selection of our material, no one will find any difficulty whatever in making a syrup of hydriodic acid which in every way, shape and manner, will comply with the standards of the Pharmacopœia as they are now. There can be no possible fault found with that formula. I make for a certain retailer quite large quantities of this preparation. I do not use rock candy for my syrup, on account of living in a comparatively small town where I cannot obtain the sugars such as Mr. Ebert says he can, living in a large city. But I use the next best thing: Instead of using granulated sugar and then freeing the finished product of the coloring matter, I use the cut-loaf sugar, and find that it works admirably. It makes a preparation that is permanent under proper conditions. In the fifty gallons, perhaps, I have made in the last four years, I have never had an ounce that discolored or deteriorated, and I have tested it when first made, and have tested some of it after a year or more, and found it to contain the full per cent. of hydriodic acid. I do not believe we should make any change in the formula to the one proposed in this paper.

MR. KOCH: I have seen great numbers of these syrups which, after having been kept

for some time, get dark, and this darkening effect was formerly ascribed to free iodine. The work that I have seen done has demonstrated that this is not the case, but that it is due to the caramelization of the sugar. I think I have demonstrated—at least to my satisfaction—that this caramelization will take place in the syrup made according to the Pharmacopœia formula. I have found, however, that if the quantity of sugar is reduced to either one-half or two-fifths of the original quantity, a syrup can be made permanent in every respect.

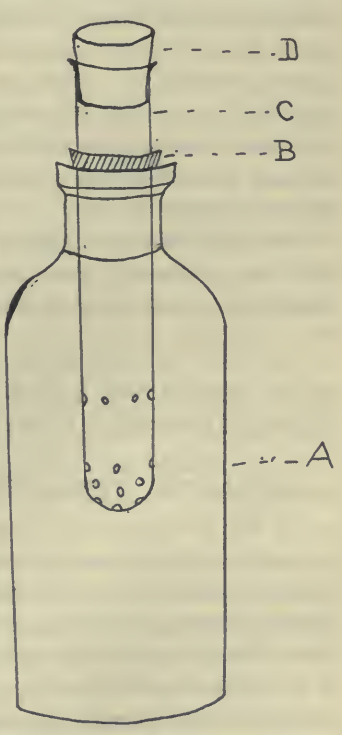
The Chair then put the vote on Mr. Ebert's motion to receive the paper and refer, and it carried.

Mr. M. I. Wilbert, at request of the Chair, then read the following paper, giving some ocular demonstrations of the effectiveness of the apparatus described, and receiving the applause of the audience:

## A CIRCULATORY APPARATUS FOR MAKING SOLUTIONS OF IODINE.

M. I. WILBERT, PHILADELPHIA.

That liquid preparations of iodine are not stable, has been known for a number of years. Dr. Coindet, one of the first physicians to use iodine as a medicinal agent, was probably the first to call attention to this fact. (Fisher on Iodine, A. J. P., 1829, p. 87.) Recognizing the fact that solutions of iodine deteriorate rapidly on standing, some way of making small quantities of these solutions, with the least possible expenditure of time and energy, would appear to be desirable.




From our experience, this is readily accomplished by the use of a simple circulatory apparatus, made from a wide-mouth-bottle and an ordinary test tube.

A test tube having an outside diameter of from 2. to 2.5 Cm. is to be preferred. This should have from 12 to 15 holes, about 1 Mm. in diameter, in the bottom and lower portion of the side of the tube. A perforated tube may be made by heating a small area of the tube in a Bunsen flame, touching the heated portion with a glass rod sufficiently long to make it adhere, then, by pulling gently on the rod, a localized projection is formed that is later broken off; the irregularly shaped holes thus produced are reduced in size and the tube restored to its former shape by heating.

The operation is a simple one when performed by an expert; for the

average individual it is perhaps easier and more satisfactory to buy the tubes, as they are quite inexpensive. The outer diameter of the tube should fit closely the inner side of the neck of the bottle; the tube can then be held at any height by using a heavy rubber band, this at the same time acting as a stopper for the bottle.

The appended diagram illustrates the apparatus complete.

*A*, the wide-mouth bottle; *B*, the rubber band acting as a stopper and holding *C*, the perforated test tube, at any desired point, the whole apparatus is completely closed by the stopper *D*.

For making 200 Cc. of tincture of iodine, 150 Cc. of alcohol are put in the wide-mouth bottle, the rubber band is then adjusted so that the upper row of perforations in the tube are well above the line of the liquid, the necessary amount of iodine is then placed in the tube and the whole apparatus, closely stoppered, is then set aside for from one-half to two hours in a cool, dark place. When all the iodine is dissolved, the solution is poured into a graduated flask, or suitable receptacle, the circulatory apparatus is washed out with the remaining portion of the alcohol, and this is then added to the first portion to make up the required amount. For making Lugol's Solution, or the U. S. P. test-solution of iodine, about three-fourths of the required water is placed in the bottle, the tube adjusted as before; the potassium iodide is then first dissolved, the apparatus well shaken to mix the solution, the iodine added and the apparatus stoppered and set aside. When the iodine is dissolved, the preparation is finished by washing the apparatus with sufficient distilled water to make up the required amount.

This apparatus is, of course, applicable to the making of a number of solutions, particularly of such chemicals as are deteriorated by organic matter or are not readily soluble.

The Chair then called on Mr. Frank E. Fisk, of Chicago, to read a paper upon the same general subject, and the gentleman read the following paper, upon which he was applauded:

## CIRCULATORY DISPLACEMENT AS A PHARMACEUTICAL PROCESS.

BY FRANK E. FISK.

Among the processes of operative pharmacy there are few, if any, more generally practical or more readily adapted to the every-day requirements of the pharmaceutical laboratory than that of "circulatory displacement," nor is there one more generally neglected by pharmacists.

Why this condition of things continues to prevail is a little difficult of comprehension, though ignorance of the principle and practicability of the process is doubtless responsible for much of this negligence.

The theory of the process, which is well understood by many, consists in subjecting the substance, to be dissolved or exhausted, to the action of

successive portions of the menstruum, or solvent, in such a manner as to insure at all times contact of the drug with the freshest of the solvent, in contradistinction to ordinary maceration; for, in keeping with the law of gravitation, the impregnated solvent descends, being replaced by the lightest, therefore the freshest, of the same, thus creating a circular motion of the menstruum—a condition more than equivalent to maceration with constant agitation or shaking—with the economic advantage of replacing manual labor by one of nature's laws.

*Utensils Necessary.*—Another commendable feature of the process is the simplicity of the utensils required, coupled with the fact that the facilities are always at hand, or may be extemporized at little or no cost, by the least skilful of pharmacists, providing Nature has equipped them with an element too often lacking among "knights of the mortar and pestle," viz., a foresight that enables them to *save*, rather than *discard* as valueless, those articles which accumulate from time to time, such as the wide-mouth bottles for clarified honey and druggists' confectionery, larger-size containers for granular effervescent salts, cork-bags, screw-eyes from picture-frames that have served their time, and many other articles which, when utilized, materially lessen the losses which they are bound to sustain from numerous other sources, not to mention the educational advantage derived along lines economic.

The displacement jars above referred to, varying in capacity from 250 to 2,000 cubic centimeters, preferably of transparent or clear glass, should be as nearly cylindrical in shape as conveniently obtainable, and each accurately fitted with a first-quality, moderately short and slightly tapered cork, through the center of which, from the under surface, passes an ordinary, steel screw-eye, of such length as to allow a projection above the upper surface of from one to two centimeters of the thread end, to which should be attached a turned-wood knob of inverted pear, acorn or other convenient shape, to facilitate the removal of the cork.

To each displacement jar or bottle should next be attached a perpendicular strip of white paper, and by means of long and short, heavy and light lines and small and capital letters, indicate the measure in liters, deci-liters and centi-liters. Next, weigh each accurately while empty, noting the tare on the margin, and coat the entire surface of the graduated strip with collodion to prevent erasure. To complete the equipment, each shall be furnished with an assortment of cylindrical bags of appropriate diameter, made of gauze, muslin, bolting-cloth, etc., provided with puckering-string at the top for closing same, and provide means of attachment to the screw-eye support in center of cork, and long enough to admit of the immersion of the bag and contents in the solvent of the menstruum.

Having considered the process and the necessary utensils, we will endeavor to indicate the instances where the process may be advantageously

employed. In the preparation of mucilage of acacia for example, the method is easily the most expeditious, the most cleanly, the most economical as to labor, and consequently the best, as the heavy gauze or muslin bag serves well the preliminary or washing process, strains the mucilage as the solution is effected, a spiral twisting of the bag at the close, finishing the product. Syrup of althaea and syrup of allium are striking examples of the adaptability of the process to the art of syrup making, producing results quite as satisfactory as the official method with the minimum of time and labor.

As a matter of fact, there are comparatively few classes of galenical liquids that do not furnish one or more instances of the superiority of this over the official or recognized process, though it is to the rather extensive class of alcoholic and hydro-alcoholic solutions of gum-resinous, resinous and balsamic substances, that we are to look for the special field of usefulness, its special mission being apparently the replacing of the ancient and unscientific method of depriving this important class of substances of their soluble constituents, by soaking them in an appropriate menstruum, a method that is altogether inadequate unless accompanied by frequent agitation, followed by expression, in the majority of instances.

Why should we continue to employ this tedious, disagreeable and unscientific method of preparing tincture of asafetida, attended with the labor of disposing of the insoluble constituents, while better and more uniform results may be had with material saving of both time and labor by the process in question? Why should pharmacists spend hours of time endeavoring to effect a solution of Tolu balsam by shaking the bottle, to whose walls the viscid substance persists in adhering, when one of nature's laws will readily solve the problem?

Why should we resort to seven days' soaking of Guaiac resin in either the alcoholic or ammoniated menstruums in the preparation of the respective tinctures, accompanied by numerous and prolonged periods of agitation, when better and more uniform results may be obtained in much less time with comparatively little labor?

Why should seven days' maceration of benzoin in alcohol be required in the manufacture of the tincture when the coarsely comminuted drug, after a few moments' trituration in contact with 10 per cent. of its menstruum, may be made to yield a superior product in seven hours by the circulatory displacement method? In short, why should the pharmacists of America continue to use this "antediluvian" method of depriving this class of drugs of their soluble constituents when a more scientific, more reliable, as well as more economical, process is ever at their disposal?

Among the special purposes that the displacement jars may be made to serve in the pharmaceutical laboratory may be mentioned the varied functions of the process of dialysis by replacing the bags of gauze, muslin, etc., with the bladder of animals, thus providing the means of utilizing this

process for the separation of crystalloids from colloids in the analysis of stomach contents where the administration of inorganic drugs as poisons is suspected.

CHICAGO, *July 14, 1903.*

MR. LOWE: I simply want to say that I have used the process described by Mr. Fisk, for a year or more past with excellent results.

Mr. O. V. SMITH: I have used this circulatory method, too. But there is one suggestion I want to make about the time set by the Revision Committee for maceration of these substances, for instance, three days for camphor, tincture of opium, and so on, and seven days for some of the resinous materials. My idea is, that it is not meant that we should absolutely let these substances macerate for the length of time indicated, but that it was intended more as a guide to those who might not understand this process thoroughly, so that they may be on the safe side. I think it simply means to secure thorough maceration, whether done in the time set or a less time.

MR. HOPP: I have made mucilage of acacia by inclosing the acacia in "tarleton" or "Swiss," as it is called, instead of muslin. The heavy liquid passes more rapidly through the tarleton than the muslin, and to all appearances strains the liquid as thoroughly as the muslin.

THE CHAIRMAN: Has that any advantage over the use of granulated acacia?

MR. HOPP: The tarleton allows a free and rapid circulatory movement, and by using large and selected tears of acacia, a mucilage is made in much less time than by the use of granulated acacia. You also avoid straining, which must be done when using granulated gum. In mixtures containing resin, such as tincture of guaiac or tincture of benzoin, in prescriptions containing water and syrups, I always use the granulated acacia, as it works better than the powdered acacia. In making mucilage of acacia I take any convenient sized, wide-mouth bottle, and put in the requisite proportions of the gum acacia, enclosed in a tarleton bag, and distilled water, filling it completely, so that there will not be space for more than three or four drops of water when the cork fits in tight. It is then put aside until complete solution has taken place.

MR. EBERT: As the question of mucilage of acacia has come up, I would like to call attention to some experiments I made when I was with Prof. Parrish in the sixties. About twenty-five per cent. of lime water added to the distilled water, I found to keep mucilage of acacia better than if made with distilled or pure water alone. This is due to the fact, no donbt, that at times the gums contain a larger percentage of mucic acid than at other times. It depends very much on the condition of the season when the gum is collected. If collected in dry weather, the mucic acid present is very much less than in wet weather. The twenty-five per cent. of lime water neutralizes this excessive acidity, and assists in the keeping quality of the mucilage.

MR. SMITH: I have used fifty per cent. lime-water, and found it worked very nicely.

MR. HOPP: Is that permissible in a prescription containing the alkaloids, such as morphine and codeine, the use of lime-water?

MR. SMITH: I did not mean in that sense.

MR. HOPP: I have found chloroform water one of the nicest things to use as a preservative.

The chair now called for the nomination of officers of the Section for the ensuing year, and Mr. Eberle, seconded by Mr. Smith, nominated Mr. W. H. Burke, of Detroit, for chairman. Mr. Burke asked the privilege of withdrawing his name, saying it would be far better to select some man more of a practical pharmacist than he was—that he was more of a commercial than practical pharmacist, having some sixty-five people in his employ. The permission asked was not accorded, and Mr. Hopp then nominated Mr. C. W. Benfield, of Cleveland, for the position of Chairman, also.

Nominations for Secretary were called for, and Mr. Claus nominated Mr. Frank E. Fisk, of Chicago. Mr. Eberle nominated Mr. E. A. Ruddiman, of Nashville, Mr. Wilbert seconding the nomination.

For Associates there were nominated Miss Jean Gordon, of Chicago, by Mr. Mason, seconded by Mr. Kennedy; Mr. William Mittelbach, of Missouri, by Mr. Whelpley, and Mr. D. F. Jones, of South Dakota, by Mr. Eberle.

On motion, the Section then adjourned to 3 p. m.

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## Second Session—Thursday Afternoon, August 6, 1903.

The Second Session of the Section on Practical Pharmacy and Dispensing was called to order at 3 : 15 p. m., by Chairman Beringer.

The chair stated that the first order of business was the reading of the minutes of the morning session, but on motion of Mr. Wilbert this was dispensed with.

The chair then called for the report of the Committee on National Formulary, and Chairman Diehl made the report in abstract, the full text thereof being as follows:

### REPORT OF THE COMMITTEE ON NATIONAL FORMULARY.

*To the President and Members of the American Pharmaceutical Association:* The present revision of the National Formulary is so closely connected with, and dependent on, the revision of the U. S. Pharmacopœia, that, in consequence of the delay in completing the latter revision, it has become impracticable for this Committee to submit a final report for approval at this year's meeting of the Association. Sufficient progress has been made, however, during the past year to warrant the belief, already expressed in last year's report, that we can look forward with confidence to its completion simultaneously with the revision of the U. S. P. Indeed, except in so far as a formal vote of the whole committee is concerned, some portions of the work have been completed and only require final adjustment and harmonization. It may suffice, therefore, for the present purpose to submit the reports received from the chairmen of sub-committees, so as to place them on permanent record and to suspend final action upon them until it has been decided what formulas now in the formulary, or proposed for admission, have been admitted into the U. S. P. These reports, with brief remarks by the Chairman of the General Committee, are as follows:

## Formulas Submitted to the National Formulary as Proposed by the Committee on Admission.

### DOSAGE FORMS OF POWDERS.

*Pulveres in Chartulis* — Powders in Papers.— Powders or triturations accurately divided in doses enwrapped in paper. If deliquescent, parchment paper is used.

*Capsulæ Amylaceæ*—Starch Capsules, Cachets, or Wafers.—Powders or triturations accurately divided and inclosed in capsules or wafers, prepared from starch-paste, pressed into concentric forms and dried.

*Capsulæ Gelatinæ*—Gelatin Capsules.—Powders or triturations accurately divided and filled into capsules of gelatin.

*Tablettæ Orales*—Tablet Triturates.—Trituration with milk-sugar as diluent, made into a paste with alcohol and formed into disks, not exceeding 0.1 Gm. in weight, by pressing the mass into molds and permitting the alcohol to volatilize spontaneously. The medicinal substance may be dissolved in the alcohol.

*Tablettæ Hypodermicæ*—Tablets for Hypodermic Use.—Powders or triturations with inorganic salts as diluents, prepared by compression, of such weight as to represent the minimum dose of the medicinal agent. To be dissolved in sterile water to furnish extemporaneous solutions for hypodermic use.

*Trochiscacao* — Chocolates — Chocolate Pastilles — Chocolate Tablets. — Mixtures of medicinal substances with cacao powder and sugar, flavored, and divided into forms weighing from 0.3 to 1 Gm.

*General Formula:* The medicinal agent is triturated with powdered sugar, the mixture incorporated with about five-sixths of its weight of cacao powder, and heated in a casserole on the water-bath until a soft mass is obtained, if necessary by the addition of a few drops of syrup. The soft mass is placed on a pill-tile, rolled out to proper thickness, and divided into the required number of equal parts with a spatula or with a troche-cutter; when cold, wrap in paraffin paper.

*Pastillæ Glycero-Gelatinæ*—Gelatin Pastilles.—Medicinal agents incorporated with glycero-gelatin mass, flavored if desired, and molded into forms weighing 0.3 to 1 Gm.

### PILL-FORMS.

*Pilulæ*—Pills.—Round, oval or ovoid masses of medicinal substances, not less than 0.1 Gm. nor more than 0.5 Gm. in weight.

The following coatings may be used:

*Gelatin-coating.*—The pills, freed from dusting-powder, may be dipped in a warm solution of gelatin and allowed to dry; or the pills may be filled in gelatin capsules.

*Sugar-coating.*—The pills, freed from dusting-powder, may be quickly rolled on a filter-paper, saturated with acacia mucilage until coated, then quickly transferred to a porcelain capsule containing a mixture of milk-sugar 8 parts and acacia powder 2 parts, and rapidly rotated until covered with a firm, white coating.

*Tolu-coating.*—The pills, freed from dusting-powder, may be rapidly rotated in a porcelain capsule, a few drops of the ethereal solution of tolu being added from time to time until the pills are uniformly covered with a varnish-like coating.

*Cacao-coating.*—The pills, freed from dusting-powder, may be quickly rolled on filter-paper saturated with acacia mucilage until coated, then shaken in a porcelain capsule containing cacao powder until coated with cacao, transferred to a clean, warmed porcelain capsule, and rapidly rotated until a smooth coating is obtained.

### OTHER FORMS OF MASSES.

*Granula*—Granules.—Round, oval or ovoid forms of masses not less than 0.03 Gm. nor more than 0.1 Gm. in weight.

Prepared in the same way as are pills; or granules of sugar may be shaken with the required quantity of an alcoholic tincture, spirit or other alcoholic solution, and dried by spontaneous evaporation of the alcohol.

*Pilulæ Entericæ*—Enteric Pills.—Pills coated with substances not readily soluble except in the colon, where the effect of the medicinal agent is desired. The two most common coatings for this purpose are:

*Keratin-coating.*—The pills are dipped in a solution of keratin and allowed to dry, as in the case of gelatin-coated pills.

*Salol-coating.*—The pills are dipped in melted salol and allowed to cool.

*Capsulæ Glycero-Gelatinæ.*—Soft gelatin capsules filled with oily or resinous liquids and sealed with melted gelatin-mass. These may also be prepared as follows: The caps of ordinary gelatin capsules are placed on a filter-paper saturated with water for a few minutes. The medicinal agent, which should be liquid or semi-liquid, is introduced by means of a pipette into the shell of the capsule, care being taken that no portion of the oil touches the exterior of the shell. The cap is now put on, the capsule kept in an upright position for a few minutes, when a perfect hermetic seal is secured.

## Report of Sub-Committee on Additions—C. S. N. Hallberg, Chairman.

### MODERN DERMATOLOGIC PREPARATIONS.

*Pastæ* (*Pastes—Dermatologic—Lassar, Unna, etc.*)—These are mixtures of starch, dextrin, zinc oxide, sulphur or calcium carbonate, made into a paste with glycerin, soap or fat, such as petrolatum or lard, medicated with antiseptic or astringent agents The following are important examples:

#### PASTA ZINCI, LASSAR (ZINC-SALYCIL).

| | | | |
|---|---|---|---|
| ℞ | Acid salicylic | gr. xxx | 2 |
| | Zinc oxide, starch, each | ʒvi | 24 |
| | Petrolatum, white | ʒxiiss | 50 |

#### PASTA RESORCINI (MITIS), LASSAR.

| | | | |
|---|---|---|---|
| ℞ | Resorcin | ʒiiss | 10 |
| | Zinc oxid, starch, each | ʒvi | 24 |
| | Petrolatum, liquid | ʒx | 40 |

#### PASTA NAPHTHOLI, LASSAR.

| | | | |
|---|---|---|---|
| ℞ | Naphthol | ʒiiss | 10 |
| | Sulphur, pp | ʒxiiss | 50 |
| | Petrolatum | | |
| | Soft soap, āā | ʒv | 20 |

#### PASTA ZINCI MOLLIS, UNNA.

| | | | |
|---|---|---|---|
| ℞ | Zinc oxid., calc. carb. pp., each | ʒvi | 24 |
| | Mix these powders and incorporate gradually: | | |
| | Lime liniment | ʒxiiss | 50 |

#### PASTA ICHTHYOLI, UNNA.

| | | | |
|---|---|---|---|
| ℞ | Ichthyol, sulf. ammon | ʒiiss | 10 |
| | Distilled water, glycerin, dextrin, each | ℥i | 30 |

#### PASTA ZINCI SULFURATA, UNNA.

| | | | |
|---|---|---|---|
| ℞ | Zinc oxide | ℥ss | 15 |
| | Sulphur, pp | ʒiiss | 10 |
| | Acid Silicic (kaolin) | gr. lxxx | 5 |
| | Benzoated lard | ʒxviiss | 70 |

PASTA DEXTRINATA.

| | | | |
|---|---|---|---|
| ℞ | Dextrin | ℥xxv | 100 |
| | Glycerin, distilled water, each | ℥xxv | 100 |

Dissolve by heat; add water to make 300 Gm. ℥x.

This is a general vehicle for many medicated pastes used in dermatology.

PASTA KAOLINI. GLYCEROPLASMA KAOLINI.

| | | | |
|---|---|---|---|
| ℞ | Kaolin, elutriated and dried | ℥xiiss | 50 |
| | Glycerite boroglycerin | ℥iiss | 10 |
| | Methyl salicylate, thymol, each | gr. i | 5 |
| | Glycerin, to make | ℥xxv | 100 |

Or sufficient to make a semi-solid paste by thorough levigation.

*Stili* (*Stili Dilubiles, Unna Pencils*).—Pencils for the direct application to the skin of medicinal agents—antiseptics, astringents, anæsthetics, etc. These agents are dissolved or mixed with a paste consisting of mucilaginous or saccharine vehicles, starch, dextrin, tragacanth, sugar, etc., rolled out into sticks about 1-5 inch (5 Mm.) in diameter and 2 inches (5 Cm.) in length, dried at ordinary temperature on parchment paper and wrapped in tin-foil.

*Gelatinæ Glycerinatæ* (*Glycerogelatin*).—Gelatin mass as a vehicle for suppositories and other external applications is used as follows:

GLYCEROGELATINA ACIDI SALICYLICI, 10 P. C., UNNA.

| | | | |
|---|---|---|---|
| ℞ | Gelatin | ℥iiss | 10 |
| | Glycerin | ℥xiss | 45 |
| | Distilled water | ℥ix | 35 |
| | Acid salicylic | ℥iiss | 10 |

GLYCEROGELATINA IODOFORMI, 10 P. C., UNNA.

| | | | |
|---|---|---|---|
| ℞ | Gelatin | gr. lxxx | 5 |
| | Glycerin | ℥v | 20 |
| | Distilled water | ℥xvi | 65 |
| | Iodoform | ℥iiss | 10 |

GLYCEROGELATINA ZINCI DURA, UNNA.

| | | | |
|---|---|---|---|
| ℞ | Gelatin | ℥iiiss | 15 |
| | Distilled water | ℥xiss | 45 |
| | Glycerin | ℥vi | 24 |

To this add gradually the following, levigated:

| | | | |
|---|---|---|---|
| | Zinc oxide | ℥iiss | 10 |
| | Glycerin | ℥iiiss | 15 |

Then mix with it enough water to make 100 Gm. The soft form (Glycerogelatina Zinci Mollis) is prepared in the same way by using 10 Gm. gelatin.

These glycerogelatins should be freshly prepared when wanted. They may be run out in moulds, oiled with cacao-fat. The zinc gelatins may be used as vehicles for ichthyol, resorcin, chrysarobin, etc. When to be applied they are melted and then pencilled on the affected part.

*Salve Mull.*—Under the name of "salbenmull," salve mulls or steatines, ointments have been introduced of higher fusibilities, spread on porous cloth, gauze or "mull," by Dr. Unna. These are mixtures of suet with lard, and sometimes wax, in such proportion as to afford a consistence adapting them to being easily spread when heated, without melting or running when applied to the body. They are intended chiefly for epidermatic effects, protective and antiseptic, but also for endermatic, astringent and resolvent action.

The mulls serve a distinct purpose in dermatology, since owing to the porous character of the fabric employed, they permit ready evaporation and thus prevent maceration of the epidermis which usually occurs from the prolonged application of more occlusive dressings. Their value as a form of application in intractable skin diseases has therefore been recognized by the highest authorities in this special branch of medical practice. The following are some of the most largely used:

UNGUENTUM EXTENSUM HYDRARGYRI CHLORIDI CORROSIVI.

2 p. mill.

| | | | |
|---|---|---|---|
| ℞ | Mercuric chloride | gr. iii | 2 |
| | Alcohol | m. lxxx 5 | |

This solution is incorporated with the following mixture previously fused:

| | | |
|---|---|---|
| Benzoated lard | ℈iv | 5 |
| Benzoated suet | ℥xxiiss | 90 |

UNGUENTUM EXTENSUM HYDRARGYRI CHLORIDI MITIS.

10 p. c.

| | | | |
|---|---|---|---|
| ℞ | Calomel | ℥iiss | 10 |
| | Benzoated lard | ℥v | 20 |
| | Benzoated suet | ℥xviiss | 70 |

REPORT OF SUB-COMMITTEE ON CONSTRUCTION OF FORMULAS.—WILBUR L. SCOVILLE, CHAIRMAN.

Under date of June 12, 1903, Prof. Scoville submitted the appended report, together with a circular letter to the members of his sub-committee, which is of sufficient general interest to be here reproduced in full. It may be remarked that Prof. Scoville has repeatedly called the attention of the Chairman of the General Committee to his failure to receive formulas for names of the preparations proposed for admission into the National Formulary to the sub-committee on additions. Some of these have been supplied by the sub-committee on additions, while others may be supplied, in so far as they may be deemed desirable. He says in this connection: "I would like to have the question of addition decided more broadly than I could have done, so if the committee is called together at Mackinac will you kindly bring up the question? If I could have a list of the unfinished additions *that are desired*, by the middle of September I would be in a position then to push the work to completion. Prof. Scoville's circular letter and report here follows:

BOSTON, MASS., *June 12, 1903.*

*Dear Sir:* Have you any formulas to offer for the next edition of the National Formulary? If so, will you kindly submit such to the committee as soon as you can?

I enclose with this some formulas which I have worked upon during the past winter, and which I desire your criticism upon or approval of.

I particularly desire your comments upon the formulas which I have called in question and about the doubtful formulas in the Cincinnati Academy Formulary. Personally, I do not think it advisable to increase the number of preparations unless the formulas are such as to meet with general (not necessarily unanimous) approval. It will conduce far more to the influence of the Formulary to treat a limited number of formulas, and treat them well, than to attempt to cover an extensive field and include a number of formulas that will be only partially satisfactory. A reputation for reliability is the best we can bring to the Formulary. Therefore, please criticise freely and return your comments lest you forget them.

Yours very truly, W. L. SCOVILLE,

*Chairman of Sub-Committee on Construction of Formulas.*

### DISINFECTANT SOLUTION.

| | |
|---|---|
| Cresylic acid, five hundred grammes | 500 Gm. |
| Colophony, three hundred grammes | 300 Gm. |
| Potassa, forty-five grammes | 45 Gm. |
| Water a sufficient quantity. | |
| To make one thousand grammes | 1000 Gm. |

Heat the cresylic acid and colophony together in a suitable dish until the resin is dissolved. Dissolve the potassa in ninety (90) grammes of water, add to the resin solution and boil until the latter is completely saponified and the liquid has become clear. Cool and add enough water to make one thousand grammes.

### SAPONATED CRESYLIC ACID.

| | |
|---|---|
| Purified cresylic acid, five hundred grammes | 500 Gm. |
| Linseed oil, three hundred and fifty grammes | 350 Gm. |
| Potassa, eighty grammes | 80 Gm. |
| Water, a sufficient quantity. | |
| To make one thousand grammes | 1000 Gm. |

Dissolve the potassa in fifty grammes of water, and add the linseed oil. Shake well together, then add the purified cresylic acid and shake or stir until the liquid becomes clear. Then add enough water to make one thousand grammes, and strain if necessary.

NOTE.—The purified cresylic acid used for this preparation should be white or nearly colorless, and must be free from tarry matters. It may be easily prepared from the crude acid by distillation, using only that portion which comes over at temperatures between 188 and 198 degrees Centigrade. This comprises the greater portion of the volatile parts of the crude acid. It is not necessary to use a thermometer in distilling, the colorless distillate being the portion desired.

### ALKALINE ANTISEPTIC SOLUTION.

| | |
|---|---|
| Potassium bicarbonate, forty grammes | 40 Gm. |
| Borax, ten grammes | 10 Gm. |
| Salicylic acid, twelve grammes | 12 Gm. |
| Benzoic acid, six grammes | 6 Gm. |
| Thymol, one-tenth gramme | 0.1 Gm. |
| Eucalyptol, one-tenth cubic centimeter | 0.1 Cc. |
| Menthol, two-tenths gramme | 0.2 Gm. |
| Oil of Wintergreen, four-tenths cubic centimeter | 0.4 Cc. |
| Solution of carmine, one cubic centimeter | 1 Cc. |
| Tincture of cudbear, fifteen cubic centimeters | 15 Cc. |
| Glycerin, two hundred and fifty cubic centimeters | 250 Cc. |
| Water, a sufficient quantity. | |
| To make one thousand cubic centimeters | 1000 Cc. |

Dissolve the potassium bicarbonate and borax in 650 cubic centimeters of water. Dissolve the acids, menthol, thymol, eucalyptol and oil of wintergreen in the alcohol, and mix with the glycerin. Then mix the two solutions, add the carmine solution and tincture, and finally enough water to make one thousand cubic centimeters. Allow to stand a few days, and filter.

SOLUBLE ANTISEPTIC POWDER.

| | |
|---|---|
| Salicylic acid, five grammes | 5 Gm. |
| Carbolic acid, one gramme | 1 Gm. |
| Menthol, one gramme | 1 Gm. |
| Thymol, one gramme | 1 Gm. |
| Eucalyptol, one cubic centimeter | 1 Cc. |
| Zinc sulphate, one hundred and twenty-five grammes | 125 Gm. |
| Boric acid, eight hundred and sixty-six grammes | 866 Gm. |
| To make | 1000 Gm. |

Mix them.

"GERMICIDE."

| | |
|---|---|
| Thymol, fifteen grammes | 15 Gm. |
| Oil of eucalyptus, sixty cubic centimeters | 60 Cc. |
| Oil of lavender, sixty cubic centimeters | 60 Cc. |
| Alcohol, eight hundred cubic centimeters | 800 Cc. |
| Water, a sufficient quantity | |
| To make one thousand cubic centimeters | 1000 Cc. |

Dissolve the thymol and oils in the alcohol, and add the water.

SOOTHING OINMENT.

| | |
|---|---|
| Resorcin, sixty grammes | 60 Gm. |
| Zinc oxide, sixty grammes | 60 Gm. |
| Bismuth subnitrate, sixty grammes | 60 Gm. |
| Oil of cade, one hundred and twenty cubic centimeters | 120 Cc. |
| Petrolatum, three hundred and fifty grammes | 350 Gm. |
| Hydrous wool fat, three hundred and fifty grammes | 350 Gm. |
| To make one thousand grammes | 1000 Gm. |

Powder the resorcin and mix with the other ingredients.

NOTE.—This ointment will darken on exposure to air and light, and it should be kept in well closed containers.

COMPOUND SYRUP OF PHOSPHATES WITH QUININE AND STRYCHNINE.

| | | |
|---|---|---|
| Potassium bicarbonate, twenty grammes | 20 | Gm. |
| Magnesium carbonate, twenty grammes | 20 | Gm. |
| Calcium carbonate, twenty grammes | 20 | Gm. |
| Soluble ferric phosphate, seventeen and a-half grammes | 17.5 | Gm. |
| Quinine hydrochloride, four and four-tenths grammes | 4.4 | Gm. |
| Strychnine sulphate, fourteen hundredths gramme | 0.14 | Gm. |
| Phosphoric acid, seventy cubic centimeters | 70 | Cc. |
| Citric acid, seventy-five grammes | 75 | Gm. |
| Orange-flower water, one hundred and twenty-five Cc. | 125 | Cc. |
| Glycerin, two hundred and fifty cubic centimeters | 250 | Cc. |
| Sugar, five hundred and twenty-five grammes | 525 | Gm. |
| Distilled water, a sufficient quantity | | |
| To make | 1000 | Cc. |

Dissolve the acids in seventy (70) cubic centimeters of distilled water, in a capacious vessel, and gradually add the magnesium and calcium carbonates, and the potassium bicarbonate. When effervescence has ceased and all is dissolved, make a solution of the

ferric phosphate and the quinine and strychnine in the orange-flower water, by aid of a little heat, and add to the first solution. Then add the glycerin and sugar, and agitate until the latter is dissolved, avoiding heat. Finally, add enough distilled water to make one thousand grammes, and filter.

(Each teaspoonful of this syrup contains one grain each of potassium, calcium, magnesium, and iron phosphates, one-fourth grain of quinine muriate, and one hundred-and-twentieth grain of strychnine sulphate.)

### MAGNESIA MAGMA.

(Milk of Magnesia.)

| | |
|---|---|
| Magnesium sulphate, two hundred and fifty grammes | 250 Gm. |
| Sodium hydroxide, eighty-one grammes | 81 Gm. |
| Water, a sufficient quantity | |
| To make one thousand grammes | 1000 Gm. |

Dissolve the magnesium sulphate in 4000 cubic centimeters of water and the sodium hydroxide in another portion of 4000 cubic centimeters of water and filter the solutions. Pour the soda solution slowly, in a thin stream, into the magnesium sulphate solution, with constant stirring. Allow the precipitate to subside and decant the clear fluid. Wash the magma several times with water by decantation until the washings are free from saline taste. Transfer the magma to a muslin strainer and allow to drain without pressing. Then re-transfer it to suitable vessels and add sufficient water to make one thousand cubic centimeters of fluid and mix thoroughly by stirring.

One teaspoonful of this preparation contains about three grains of magnesium hydroxide.

NOTE.—The water used in preparing this must be free from organic matter or the magma will become discolored. Ordinary tap water contains an excess of organic matter as a rule, but may be rendered suitable for the above by treatment with alum. To a large jug or tank full of the water add alum in the proportion of about two grains per gallon, mix thoroughly and allow to stand over night. Then decant the clear water. If the water is decidedly yellowish from organic matter more alum may be needed, but an excess of alum should be avoided, as not clearing the water so well. Long standing with a trace of alum is most effective.

The quantity of soda directed is slightly less than is required for complete precipitation of the magnesium sulphate, because caustic alkali is difficult to wash out, and its presence in the finished preparation would be decidedly objectionable.

### SOLUTION OF PEPTONATE OF IRON WITH MANGANESE.

| | |
|---|---|
| Peptonate of iron, forty-five grammes | 45 Gm. |
| Soluble citrate of manganese, eight grammes | 8 Gm. |
| Ammonia water, thirteen cubic centimeters | 13 Cc. |
| Aromatic elixir, fifty cubic centimeters | 50 Cc. |
| Alcohol, one hundred and fifty cubic centimeters | 150 Cc. |
| Distilled water, a sufficient quantity | |
| To make one thousand cubic centimeters | 1000 Cc. |

Dissolve the peptonate of iron in 250 cubic centimeters of water and add the ammonia and alcohol. Dissolve the manganese citrate in 100 cubic centimeters of water and add to the first solution. Then add the aromatic elixir and enough water to make one thousand cubic centimeters of solution.

NOTE.—Twenty-six grammes of commercial peptonate of manganese may be used in place of the soluble citrate of manganese if preferred.

SUPPOSITORIES OF BOROGLYCERIN.

| | |
|---|---|
| Gelatin, twelve grammes | 12 Gm. |
| Boric acid, eight grammes | 8 Gm. |
| Glycerin, fifty grammes | 50 Gm. |
| Water, a sufficient quantity | |
| To make one hundred grammes | 100 Gm. |

To the gelatin, contained in a suitable dish, add 30 grammes of water and heat on a water-bath until the gelatin is dissolved. Then add the boric acid and glycerin and continue the heat until all is dissolved. Add enough water, if necessary, to make the whole weigh one hundred grammes and pour into suitable moulds.

COMMENTS.

The Disinfectant Solution formula is a correction of that submitted last year, in which there was not enough resin soap.

The Saponated Cresylic Acid resembles very closely a water-soluble cresol preparation, sold under a fanciful trade name, and is easily prepared. The Pharmacopœial Committee are considering admitting a preparation of this kind to the Pharmacopœia, and if this is done it will not be necessary to include it in the N. F. The title is not good, but is here intended to distinguish it from the Disinfectant Solution. When the list of admissions to the N. F. is complete, the title can be corrected.

The Alkaline Antiseptic Solution resembles a similar trade-name preparation, and is (as are most of the formulas here given) based on analysis of that preparation.

The Soluble Antiseptic Powder will duplicate a similar trade-named preparation.

The Soothing Ointment resembles a well known proprietary ointment. As prepared it has a smoother appearance than that preparation, but in most respects it is the same. It agrees well with analysis of the proprietary article, but the resorcin and oil of cade were not estimated closely, and the quantities directed may not be just right. I wish the members would try this formula, and give their judgement on it.

The Compound Syrup of Phosphates with Quinine and Strychnine is similar to a commercial preparation of Phosphates and Muriate of Quinine. I think it will be accepted.

Suppositories of Boroglycerin are somewhat misleading in title, but correspond in boric acid strength to commercial samples. The formula makes a soft suppository, and some may prefer one that is firmer. This may be secured by increasing the gelatin to 15 Gm. and decreasing the water to correspond. I will appreciate a trial of these formulas for suppositories by the members of the committee.

Solution of Peptonate of Iron with Manganese has been the subject of much experimentation. The trade-named commercial type is composed of peptonate of iron with ammonio-succinate of manganese. The latter salt is not a commercial product, and is troublesome to make on a small scale. Ammonio-citrate of manganese has been in the market, but is not easily obtained at present. I do not think that a process that is too lengthy or troublesome will be adopted by pharmacists, however good the results. Hence a formula on the lines of the one given seems most practicable. At the present time, peptonate of manganese is more easily obtained in the market that the soluble citrate there directed. The latter makes a pleasanter preparation, and is preferable for that reason if it can be obtained. Either way, the preparation will not resemble the trade-named preparation so closely as to deceive, but either offers an acceptable substitute so far as medicinal properties are concerned. An expression of opinion is desired on this.

A "Saw Palmetto Compound" has also been the subject of experimentation. It is evidently made from fresh Saw Palmetto berries, and these are not easily obtained in the

market. It contains about 13 per cent. of alcohol by weight. An equal volume of fluid extracts of Saw Palmetto, Sandalwood, Cornsilk, and of water, makes a preparation that resembles the original in some respects, but is much too strong in alcohol, and it lacks a certain fresh characteristic property of the original. In my judgment it would be better to omit this, than to admit a formula that is not likely to be satisfactory.

All the formulas of the Cincinnati Academy Formulary have been tried. I am not personally familiar with the original of all these preparations, and therefore cannot judge of all from that standpoint. Numbers 1, 11, 22, 24, and 28 I do not think satisfactory because they do not resemble the original. Numbers 6, 13, and 25 are not good from a pharmaceutical standpoint.

No. 3 would be acceptable in New England without the syrup, but not with. No. 6 is pretty close to the Deodorized Fluid Extract of Senna of the present N. F., and its addition seems unnecessary.

No. 14 is too strong in iron and manganese, and is too highly flavored. No. 15 is also too strong in flavor and iron. A substitute for this was offered a year ago. No. 22 does not resemble "Pentabromides," either in color or flavor. An improvement on this is being tried now.

Aristol is likely to be included in the next Pharmacopœia, and No. 31 would, therefore, better be omitted.

No. 37 is usually desired without sugar.

The rest of the preparations appear all right, so far as presentable preparations are concerned.

These formulas do not by any means include all that have been proposed for admission, but it is likely that the list will be reduced to some extent.

If any member of the committee has any formulas to offer, will he kindly submit such at as early a date as possible.

## Addenda to Report of Sub-Committee on New Formulas—National Formulary.

### Elixir of Terpin Hydrate.

| | | |
|---|---|---|
| Terpin hydrate, seventeen and one-half grammes | 17.5 | Gm. |
| Tincture of fresh orange-peel, ten cubic centimeters | 10 | Cc. |
| Solution of saccharin, one cubic centimeter | 1 | Cc. |
| Alchol, four hundred cubic centimeters | 400 | Cc. |
| Glycerin, four hundred cubic centimeters | 400 | Cc. |
| Syrup, a sufficient quantity | | |
| To make one thousand cubic centimeters | 1000 | Cc. |

Dissolve the terpin hydrate in the alcohol, add the tincture and solution, then the glycerin, and finally enough syrup to make one thousand (1,000) cubic centimeters.

Note.—Each teaspoonful of this elixir contains one grain of terpin hydrate.

### Elixir of Terpin Hydrate with Codeine.

| | | |
|---|---|---|
| Codeine, two and two-tenths grammes | 2.2 | Gm. |
| Elixir of terpin hydrate, one thousand cubic centimeters | 1000 | Cc. |

Dissolve the codeine in the elixir.

Note.—Each teaspoonful of this elixir contains one grain of terpin hydrate and one-eighth grain of codeine.

ELIXIR OF TERPIN HYDRATE WITH HEROINE.

| | |
|---|---|
| Heroine, seventy-five-hundredths gramme | 0.75 Gm. |
| Elixir of terpin hydrate, one thousand cubic centimeters | 1000 Cc. |

Dissolve the heroine in the elixir.

NOTE.—Each teaspoonful of this elixir contains one grain of terpin hydrate and one-twenty-fourth grain of heroine.

SYRUP OF THE BROMIDES.

| | |
|---|---|
| Potassium bromide, eighty grammes | 80 Gm. |
| Sodium bromide, eighty grammes | 80 Gm. |
| Ammonia bromide, forty-eight grammes | 48 Gm. |
| Calcium bromide, twenty-four grammes | 24 Gm. |
| Lithium bromide, eight grammes | 8 Gm. |
| Tincture of vanillin, thirty cubic centimeters | 30 Cc. |
| Compound tincture of cudbear, fifteen cubic centimeters | 15 Cc. |
| Compound syrup of sarsaparilla, four hundred and fifty cubic centimeters | 450 Cc. |
| Syrup, a sufficient quantity | |
| To make one thousand cubic centimeters | 1000 Cc. |

Dissolve the bromides in the syrup of sarsaparilla and four hundred cubic centimeters of syrup, add the tinctures, and then enough syrup to make one thousand (1000) cubic centimeters.

Will the members of the Committee kindly criticise these formulas, with the others sent previously. WILBUR L. SCOVILLE.

REPORT OF SUB-COMMITTEE ON CORRECTION OF FORMULAS.—A. B. STEVENS, CHAIRMAN.

The following report, received after Prof. Stevens had departed for a prolonged sojourn abroad, is to be regarded as final, in so far as the sub-committee on correction of formulas is concerned, and it is the outcome of a series of systematic discussions and votes circulated by Prof. Stevens in the course of the last two years. Considerable information has thus been collected, which is available in manuscript, but too voluminous to be reproduced with the present report of the sub-committee, the full text of which is as follows:

PRETORIA, HAMBURG AMERICAN LINE, *June 29, 1903.*

*National Formulary Committee, Prof. C. Lewis Diehl, Chairman:*

*Dear Sir:* Your committee on corrections of formulas has practically completed its work and herewith submits the results of its labors, and respectfully recommends that the following changes be made:

No. 23. Chloral Camphoratum. Powder separately and mix by trituration until completely liquified.

No. 31. Elixir Adjuvans. Replace the present formula with the following:

| | |
|---|---|
| Solution of extract of liquorice | 60 Cc. |
| Solution of saccharin | 30 Cc. |
| Aromatic elixir a sufficient quantity | |
| To make | 1000 Cc. |

By using the following formula cross references would be avoided:

| | |
|---|---|
| Purified extract of liquorice, dried | 15 Gm. |
| Saccharin | 2.1 Gm. |
| Sodium bicarbonate | 1 Gm. |
| Water | 60 Cc. |
| Aromatic elixir a sufficient quantity | |
| To make | 1000 Cc. |

Mix the powders and dissolve in the water on a water-bath, then add the aromatic elixir.

No. 33. Elixir ammonii valerianatis. Increase the chloroform from 0.8 to 1.3 Cc.

No. 45. Elixir Catharticum Compositum. Replace the present formula with the following:

| | |
|---|---|
| Fluid extract of senna | 100 Cc. |
| Fluid extract of buckthorn | 130 Cc. |
| Fluid extract of rhubarb | 65 Cc. |
| Oil of peppermint | 1.4 Cc. |
| Solution of potassium hydroxide | 4.5 Cc. |
| Saccharin | 4.5 Gm. |
| Aromatic elixir, sufficient quantity | |
| To make | 1000 Cc. |

Allow to stand 24 hours and filter.

Nos. 47, 48 and 98 are to be dropped and the following added:

ELIXIR CINCHONÆ (ALKALOIDS).

| | |
|---|---|
| Quinine sulphate | 2 Gm. |
| Cinchonidine | 1 Gm. |
| Cinchonine sulphate | 1 Gm. |
| Tincture of cudbear compound | 50 Cc. |
| Aromatic elixir, a sufficient quantity. | |

Dissolve the alkaloid in 900 Cc. of aromatic elixir and add the compound tincture of cudbear. Mix 250 cubic centimeters of the mixture with 15 grams of powdered pumice and pour on a filter, returning the first portion until it comes through clear. Then add the remainder and when it has all passed through add enough aromatic elixir, through the filter, to make 1000 Cc.

No. 68. To be dropped.

No. 76. Elixir Glycyrrhizæ. Change directions to read as follows: Rub the fluid extract with 5 grams of magnesium carbonate and then with 500 Cc. of the elixir. Filter and add enough elixir through the filter to make 1000 Cc. Magnesium carbonate should also be placed in the formula.

No. 88. Elixir Pepsini. Replace the present formula with the following.

| | |
|---|---|
| Glycerite of pepsin | 200 Cc. |
| Glycerin | 100 Cc. |
| Hydrochloric acid | 2 Cc. |
| Aromatic elixir, sufficient quantity | |
| To make | 1000 Cc. |

Mix.

No. 89. Elixir Pepsini, Bismuthi et Strychninæ. Replace the present formula with the following:

| | | |
|---|---|---|
| Strychnine (alkaloid) | 0.273 | Gm. |
| Tartaric acid | 0.273 | Gm. |
| Elixir pepsin and bismuth | 1000 | Cc. |

Triturate the strychnine and tartaric acid in a mortar with 25 Cc. of the elixir, then add the remainder.

Each fluid drachm represents $\frac{1}{64}$ grain of strychnine, $\frac{1}{2}$ grain of pepsin and 2 grains of bismuth and sodium tartrate.

No 90. Elixir Pepsini et Bismuthi. Replace the present formula with the following:

| | | |
|---|---|---|
| Pepsin | 8.8 | Gm. |
| Glycerite of bismuth | 125 | Cc. |
| Glycerin | 125 | Cc. |
| Water | 250 | Cc. |
| Caramel | 5 | Cc. |
| Aromatic Elixir | 500 | Cc. |

Dissolve the pepsin in the water and add the glycerin, then add the elixir previously mixed with the glycerite of bismuth and caramel. Filter if necessary. Each fluid drachm represents $\frac{1}{2}$ grain of pepsin and 2 grains of bismuth and sodium tartrate.

No. 101. Elixir Rhamni Purshianæ. Replace the present formula with the following:

| | | |
|---|---|---|
| Aromatic fluid extract of rhamnus purshiana | 500 | Cc. |
| Aromatic elixir | 500 | Cc. |

Mix them and filter if necessary.

No. 185. Glyceritum Bismuthi. Replace the present formula with the following:

| | | |
|---|---|---|
| Bismuth subnitrate | 156 | Gm. |
| Nitric acid | 148 | Cc. |
| Tartaric acid | 236 | Gm. |
| Sodium bicarbonate | 266 | Gm. |
| Glycerin | 500 | Cc. |

Distilled water a sufficient quantity.

Dissolve the bismuth subnitrate in the nitric acid previously diluted with 300 Cc. of water; to the solution slowly add 600 Cc. of water. Now add 118 Gm. of powdered tartaric acid, and then gradually 133 Gm. of sodium bicarbonate. Dilute the magma of bismuth tartrate with 1000 Cc. of water. Set the mixture aside for five or six hours, then wash by decantation and diffusion of water until all nitric acid has been removed; drain the precipitate on a filter. Mix 133 Gm. of sodium bicarbonate with 150 Cc. of water and gradually add 118 Gm. of tartaric acid and warm slightly to obtain a perfect solution. Transfer the precipitate of bismuth tartrate to the solution of sodium tartrate and stir until dissolved. Filter the solution, add the glycerin and evaporate on a water-bath, or add water as may be necessary so that the fluid shall measure 1000 Cc.

Each fluid drachm contains 16 grains of bismuth and sodium tartrate.

No. 195. Lac Fermentatum. Insert the following between the formula and the directions: Compressed yeast, 1.5 Gm., mixed with 5 Cc. of the milk, may be used in place of the semi-liquid yeast.

No. 206. Change the name from "Liquor Acidi Phosphorici Compositus" to "Liquor Phosphatis Acidi."

No. 211. Liquor Auri et Arsenii Bromidi. Change the words and figures in line 3, p., 77, from "900" to "600," and add after the directions the following: "The tribromide of gold may be made by placing 1.466 Gm. of gold-leaf in a flask containing 350 Cc. of

water and 15.8 Gm. of bromine. Shake until the gold is dissolved, then boli to expel excess of bromine. When cold this may be added to the previously prepared solution of bromide of arsenic and diluted to 1000 cubic centimeters."

No. 226. Liquor Iodi Carbolatus. Change the word "tincture" to "solution." It hould be compound solution of iodine.

No. 231. Liquor Morphinæ Hypodermaticus. Add to the formula, "Salicylic acid 0.1 Gm."

No. 233. Recommend that it be dropped.

No. 235. Liquor Phosphori. Change the first two lines of directions to read as follows: Place the phosphorus in a flask with thirty (30) cubic centimeters of absolute alcohol. Close the flask with a perforated stopper containing a glass tube about sixty-five centimeters long (24 inches). Dissolve by immersing in a water-bath, etc.

No. 261. Mistura Chlorali et Potassii Bromidi Composita. Replace the present formula with the following.

| | |
|---|---|
| Chloral | 125 Gm. |
| Potassium bromide | 125 Gm. |
| Extract of Indian cannabis | 1 Gm. |
| Extract of hyoscyamus | 1 Gm. |
| Tincture of quillaja | 30 Cc. |
| Alcohol | 30 Cc. |
| Pumice | 40 Gm. |
| Caramel | 6 Cc. |
| Water | 450 Cc. |
| Adjuvant elixir, sufficient quantity | |
| To make | 1000 Cc. |

Dissolve the chloral and potassium bromide in the water. Triturate the extracts with the alcohol, tincture of quillaja and pumice. Then add slowly, with constant trituration, the elixir and solution of chloral and bromide. Finally, filter, and add enough elixir through the filter to make 1000 Cc.

It is also recommended that some short name be given this preparation, as "Nervinol." (Nos. 261 and 262 will now be perfectly clear solutions, and therefore should not be classed among the mixtures. I therefore move that the word "Mistura" be dropped. A. B. S.)

No. 371. Syrupus Ferri Citro-iodidi. In second line of directions, change "45" to "40," and in seventh line, change "14" to "19."

No. 378. Syrupus Hypophosphitum Compositus. Replace the present formula with the following:

| | |
|---|---|
| Calcium hypophosphite | 17.5 Gm. |
| Potassium hypophosphite | 17.5 Gm. |
| Sodium hypophosphite | 17.5 Gm. |
| Ferric hypophosphite | 2.25 Gm. |
| Manganese hypophosphite | 2.25 Gm. |
| Sodium citrate | 3.75 Gm. |
| Quinine (alkaloid) | 1.1 Gm. |
| Strychnine (alkaloid) | 0.115 Gm. |
| Hypophosphorus acid (50 per cent.) | 2. Cc. |
| Sugar | 775. Gm. |
| Distilled water sufficient | |
| To make | 1000 Cc. |

Mix the iron hypophosphite, manganese hypophosphite and sodium citrate with 30 Cc. of water and heat until a greenish solution results. Dissolve the quinine and strychnine in 80 Cc. of water, with the aid of 1.5 Cc. of hypophosphorus acid. Then triturate the calcium, sodium and potassium hypophosphites together and dissolve in 450 Cc. of water, to which the remaining 0.5 Cc. of acid has been added. Finally, dissolve the sugar in the mixed solutions, strain and add sufficient water to make 1000 Cc.

Change the amounts in the italics to conform with the changes in the formula.

The above makes a clear syrup. If a cloudy syrup is desired, add 10 Gm. of sodium pyrophosphate, previously dissolved in 30 Cc. of hot water to 970 Cc of the clear syrup.

No. 400. Tinctura Antiperiodica. Sieker's formula (Am. Jour. Pharm., 1901, Vol. 72, p. 571) has been adopted, with the following modifications: Use an equivalent amount of quinine bisulphate in place of the quinine sulphate and sulphuric acid. This formula contains about 18 per cent. more of some of the ingredients than the present formula. Half of the committee are in favor of retaining the present strength, while the others favor the increased strength. Prof. Diehl, or the General Committee, will please decide. (I would copy the formula if I had it with me.)

No. 404. Tincture Conii. In first and third lines from the bottom of page, change "grammes" to "cubic centimeters," and "Gm." to "Cc." Also in first and fifth lines from top of next page, change "grammes" to "cubic centimeters."

No. 407. Tinctura Ferri Citro-chloridi. Reduce the amount of sodium citrate to 410 Gm.

No. 410. Tinctura Ignatiæ. In the first line of directions change the word "weight" to "volume." In the third, sixth and last lines change "grammes" to "cubic centimeters. In the sixth and eighth lines from the bottom change the word "part" to "cubic centimeters." In the fourth line from the bottom change "parts" to "grammes," and in the fifth line from the bottom change the word "weight" to "measure."

No. 440. Vinum Album Fortius. Change the amounts in formula to

| | |
|---|---|
| White wine | 850 Cc. |
| Alcohol | 150 Cc. |

No. 441. Vinum Aloes. In the third line from the bottom of page change "grammes" to "cubic centimeters," and "Gm." to "Cc." In the first and fourth lines from the top of next page change "grammes" to "cubic centimeters," and in the third line change "weight" to "measure."

No. 444. Vinum Carnis. Change the directions to read as follows: Rub the extract of beef with the hot water, and add while stirring, 125 Cc. of alcohol. Allow the mixture to stand three days or more, then filter and distill off the alcohol and add sherry wine to make 1000 cubic centimeters.

No. 445. Vinum Carnis et Ferri. Replace the present formula with the following:

| | |
|---|---|
| Extract of beef | 35 Gm. |
| Tincture of citro-chloride of iron | 35 Cc. |
| Compound spirit of orange | 1 Cc. |
| Hot water | 60 Cc. |
| Alcohol | 125 Cc. |
| Syrup | 125 Cc. |
| Sherry wine, sufficient | |
| To make | 1000 Cc. |

Rub the extract of beef with the hot water, and add, while stirring, the alcohol. Allow to stand three days or more, then filter and distil off the alcohol. Add to the residue 750 Cc. of the wine, to which the compound spirit of orange has been

previously added. Finally add the tincture of citro-chloride of iron, syrup and enough wine to make 1000 cubic centimeters. Filter if necessary.

No. 446. Vinum Carnis, Ferri et Cinchonæ. Add 125 Cc. of alcohol to the formula, and change the directions to read as follows: Rub the extract of beef with the hot water, and add, while stirring, the alcohol. Allow to stand three days or more, then filter and distil off the alcohol. Dissolve the acid and alkaloids in the residue, while hot, and add water to make 60 Cc. Then add 800 Cc. of Angelica wine and afterwards the tincture of citro-chloride of iron. Filter and add, through the filter, enough wine to make 1000 cubic centimeters.

No. 450. Vinum Pepsini. Replace the present formula with the following:

| | |
|---|---|
| Glycerite of pepsin | 135 Cc. |
| Alcohol | 135 Cc. |
| White wine, sufficient | |
| To make | 1000 Cc. |

Mix the wine and alcohol, then add the glycerite of pepsin.

This preparation should be prepared fresh when wanted.

No. 454. Vinum Rhei. In the first and fourth lines from the bottom, change "grammes" to "cubic centimeters," and in the fifth line change "Gm." to "Cc."

Use 5 Gm. of magnesium carbonate in place of purified talc in Nos. 61, 62, 232 and 394; also 25 Gm. of magnesium carbonate in place of pumice in No. 250.

Use pumice in place of purified talc in Nos. 59, 187, 234, 356, 357, 364, 442 and 452.

Use hypophosphorous acid in place of citric acid in Nos. 43, 48, 81, 82, 107, 225, 360, 361 and 393.

Respectfully submitted,

CHAS. CASPARI, JR.,
FRANCIS HEMM,
H. P. HYNSON,
A. B. STEVENS, *Chairman*,
*Committee.*

In connection with these reports the following criticisms of Prof. Francis Hemm deserve attention. Speaking of Prof. Scoville's proposed formula for

1. *Glycerin Tonic of Gentian*, he says: "It occurred to me that the formula (while a fine one) should be more expeditious for the dispensing pharmacist, and accordingly I used the U. S. P. fluid extracts of dandelion and gentian. I finished and filtered the preparation in one hour (filtered through powdered pumice), and I got an elegant preparation. For principle's sake I call your attention to this formula, which I suggest be as far as practicable carried out with all the rest, *i. e.*, make them as simple and expeditious as possible. A formula which will afford rapid results is the one that will always be popular with the busy, and also lazy, pharmacist. Let us try and make our formulas popular. The title should be: 'Elixir Gentianæ Glycerinatum,' not glycerinata as my advance sheet has it.

"2. *Emulsum Petrolei.*—I don't like the preparation. In the first place twice as much acacia and tragacanth should be used; I have tried both, and the one I suggest makes a much more perfect emulsion. Then, too, I think its taste and odor repulsive. I think it ought to be made palatable and pleasant to the sense of smell. Would add Solution of Saccharin and Fresh Oil of Orange.

"3. *Liquor Antisepticus.*—I would consider it an improvement to make this preparation in a few hours instead of requiring two weeks.

"4. *Syrupus Quinidinæ.*—Why not use lemon flavor instead of orange flower?

"5. *Liquor Ferri Albuminati* and *Liquor Ferri Peptonati.*—I think are good preparations."

The Chairman of the Committee refrains from comments on these reports at this time, since he proposes to call a meeting of the Whole Committee while at Mackinac, for their consideration, for determining the lines for further action, and for the purpose of deciding certain points upon which individual members of the Committee are not a unit, so that a final report may prove satisfactory to the Association, and the revised Formulary acceptable to the medical and pharmaceutical professions.

Respectfully submitted, C. Lewis Diehl, *Chairman.*

When Mr. Diehl had concluded the presentation of his report, he said that he regretted that Mr. Scoville and Mr. Hemm had found it necessary to mention any of these proprietary preparations, and if it was the sense of the Section he would like to have instructions to have them omitted from the report; that he had considered it his duty to bring the report before the Section as made.

Thereupon Mr. Eberle moved that the report be received and referred for publication, with the elimination of all names of proprietaries and the word "substitutes." The motion was seconded by Mr. Wilbert and carried.

Mr. Beringer: I would suggest that the German Pharmacopœia formula for Liquor Cresoli Saponatus would yield a liquid antiseptic preparation which is entirely soluble in water, and would make a very desirable antiseptic liquid for introduction either into the National Formulary or the Pharmacopœia.

Mr. Diehl: I wish to call the attention of the members to the fact that all of these formulas, and all of this work of the Committee on National Formulary, are simply tentative. Every formula will not go into the Pharmacopœia, though some of them doubtless will. It was necessary for the committee to do this work, because of the uncertainty as to whether it would be taken up by the Committee of the U. S. Pharmacopœia.

Mr. Hopp suggested the desirability of a formula for a more palatable quinine mixture than that given by the Pharmacopœia, and spoke of the prejudice against it.

Mr. Renshaw: I have had some little experience in another direction, which I would suggest that the Committee on National Formulary might consider. Our physicians prefer the formula given in the National Formulary under the name Pulvis Pepsini Compositus; they prefer it to any other preparation in that shape. Now I had, at the beginning, some difficulty in making a nice, finished powder, such as you find in other makes; and I would suggest to the committee, if this is the proper time, that after the preparation has been completed as the formula recommends, it be spread out very thin and allowed to remain that way for twelve hours, and then brushed through a sieve as directed, and you will have as fine a powder as you can possibly make. I do not know what the experience of other members of the Association has been, but I had found it utterly impossible to make anything but a coarsely granulated powder; and I think it is owing to the acids, lactic and hydrochloric, that dampen the powder, so that if it is put away it will become granular. All that is needed is to dry it and then put it through the sieve.

Mr. Eliel: I would like to ask Mr. Diehl a question: In my section of the country the demand is strong for a syrup of white-pine compound, with terpin hydrate and

codeine. Does the National Formulary contain any such formula? I know a firm putting on the market a preparation of this kind, and they claim that their preparation contains three grains of terpin hydrate to the fluid drachm, in connection with one-eighth of a grain of codeine sulphate. I have tried twenty ways to dissolve and hold in solution that amount of terpin hydrate, and find it impossible to do so. I doubt whether anybody can succeed in holding in solution one grain in a fluid drachm; I have not succeeded in holding it in permanent solution.

MR. SMITH: The statement is true in regard to an aqueous solution. It cannot be done, so far as my experience goes.

MR. DIEHL: Mr. Chairman, I have no doubt if the gentlemen wish to have formulas of that kind introduced that the Committee on National Formulary will take charge of any suggestions made, provided the formula is communicated. If they expect the committee to originate a formula, on the suggestion of the manufacturer, I would say that I do not think that would be practical.

MR. ELIEL: The Formulary is supposed to contain practical formulas that we can make ourselves. Syrup of white-pine compound is very popular, and the druggists can make it themselves; it is on the list of every manufacturing pharmacist. I have been making a preparation of this kind, and in rather large quantities; but as I say, I have not been able to get that amount of terpin hydrate into the preparation. I have been able to dissolve with difficulty six grains in one fluid ounce.

THE CHAIRMAN: The Secretary has received a postal card from one of our members which contains this query: "We have been unable to make a hypodermic tablet as soluble as is claimed by the manufacturers. They claim theirs dissolve in a few seconds; ours take three times as long. Will some member suggest a way to make them soluble?"

MR. PAYNE: I understand that the common practice is to use a small amount of some dry organic acid and a small amount of bicarbonate of soda, so that a few bubbles of carbon dioxide are given off, and the tablet disintegrates and dissolves very quickly. I gave this formula to a manufacturer who said he could not make his tablets dissolve, and the next time I saw him he said his tablets dissolved beautifully. I asked him if he had adopted my suggestion, and he said, "My tablets dissolve beautifully," and that is all I could get out of him.

THE CHAIRMAN: If there is no further discussion of this paper we will proceed to the reading of the other papers, and the next one on the list is upon the subject of "Soluble Iodine," by Mr. M. I. Wilbert.

Mr. Wilbert read his paper, as follows:

## SOLUBLE IODINE.

M. I. WILBERT, PHILADELPHIA, PA.

Under this title a liquid preparation, purporting to be a particularly active combination of iodine, freely soluble in water, is being advertised quite extensively at the present time. The preparation comes in square one-ounce, cork-stoppered vials, and may be obtained by the retail pharmacist at one dollar an ounce. The solution is dark reddish-brown in color, and has the characteristic odor of iodine; it also manifests the well-known corrosive action of iodine on organic materials, the corks of the vials so far examined being discolored and corroded.

The solution mixes readily with water, in nearly all proportions. In the directions that accompany the preparation, it is recommended that the same be dispensed diluted with at least fifty parts of water.

On examination, it was found that 10 Cc. of the solution weighed 8.32 grammes, and required 16.2 Cc. of decinormal sodium thiosulphate volumetric solution, to discharge the blue color of iodized starch. This would indicate the presence of nearly 2.05 per cent. of free iodine, while the weight of the solution indicated the presence of U. S. P. alcohol as a solvent.

A two per cent. solution of resublimed iodine in alcohol was then made; 10 Cc. of this solution weighed 8.31 grammes, and required 15.8 Cc. of decinormal volumetric solution of sodium thiosulphate to completely discharge the blue color of the iodized starch.

The odor of the solution, made from resublimed iodine, was found to be rather more pungent than that of the proprietary preparation. Another solution, made with iodine that had been purified, as directed for the U. S. P. test solution, was found to correspond much more closely, in all respects, to the proprietary preparation.

In this connection, it may be of interest to call attention to a preparation that appears to have been used quite extensively, in this country, nearly fifty years ago. It was advertised and sold as ——— liquid iodine. According to Professor Procter (A. J. P., 1857, page 190), this preparation consisted of an aqueous (1–1000) solution of iodine with hydriodic acid.

The manufacturers of liquid iodine made quite as liberal claims for the efficiency of their preparation, and found quite as many reliable medical practitioners who were willing to endorse it as do the manufacturers of soluble iodine at the present time. It is quite possible that iodine, in minute doses, well diluted with water, may constitute an ideal method for securing the medicinal action of this drug, without causing the disagreeable gastric symptoms so frequently resulting from the administration of the iodides in large doses. At all events, it is a point well worth bringing to the attention of physicians who would be likely to give it a trial.

MR. HOPP: In the last two or three months, I think, I had occasion to make up a mixture of compound solution of iodine, 1 ounce, and resorcin, ¼ ounce; this makes a perfectly clear solution with water, without any disagreeable taste, and can be borne by the stomach, and you can give four times the amount of iodine in that form.

THE CHAIRMAN: In what combination would the iodine be?

MR. HOPP: That I do not know. It is prepared with resorcin—an equal amount of iodine and resorcin—and is not caustic in the least.

MR. HALL: The statement has been made in our section that in the administration of potassium iodide 99 per cent. passed through the body unchanged. That is the statement of representatives of this soluble iodine in our locality; I would like to ask for information, is that correct?

MR. PAYNE: In reply to that, I have tested this on a good many hundred men by

giving them capsules with pure iodide of potassium in them, and in fifteen minutes afterwards I have gotten iodine reaction in the saliva, which showed that it went into the circulation very promptly.

MR. WILBERT: The manufacturers of the particular preparation I have in mind claim alcohol as a solvent.

MR. KIRSCHGESSNER: I talked to the man who got it up, and he said it contained no alcohol or alkaloids, or anything of the sort.

MR. GORDON: In regard to the elimination of iodides, a few years ago I was making experiments along this line, and had occasion to consult the authorities, and while I am not sure that 99 per cent. of the iodide, as such, was eliminated, yet it is a fact that almost all the iodide taken up by the system is practically eliminated through the urine. There is little eliminated through the perspiration and the saliva.

MR. DIEHL: Mr. Chairman, I was, unfortunately, afflicted with a catarrhal trouble, which was relieved by small doses of potassium iodide, half a grain at a dose, and in five minutes afterwards, if I happened to blow my nose, I got the peculiar odor of iodine.

At request of the Chair, the Secretary read the following paper from Mr. Dunning, of Baltimore, in the absence of the author, the paper being greeted with applause:

## SHOULD METHYL ALCOHOL BE RECOGNIZED BY THE PHARMACOPŒIA, OR IS ITS USE ALLOWABLE IN ANY MEDICINAL PREPARATION?

BY H. B. DUNNING, BALTIMORE.

The question whether or not methyl alcohol is more toxic than ethyl alcohol when taken internally has been agitated for the last few years, until at the present time it would seem that a climax has been reached.

There was little or no experimental work undertaken, in America, to establish the degree of toxicity as compared with ethyl alcohol until the recent experiments performed upon dogs and rabbits by Dr. Reid Hunt, of Johns Hopkins University. This fact accounts largely for the lack of information in our English text-books regarding the poisonous properties of this alcohol. Although little work has been undertaken in this country to establish the physiological action of methyl alcohol, considerable has been done in the European countries. The German text-books on toxicology fully discuss the subject.

According to Dr. Hunt's paper on "The Toxicity of Methyl Alcohol," Pohl, an eminent pharmacologist, Joffrey, Servereaux and other experienced investigators upon the toxicity of alcohols, established the fact that the action of methyl alcohol on the body was decidedly different from that of ethyl alcohol and other alcohols of that series. This difference was also observed by Dr. Hunt, in his experiments conducted at Johns Hopkins University in 1902, and fully described in the above-mentioned paper.

As established by the authorities, previously mentioned, in their experi-

ments on various animals, dogs, rabbits and monkeys, the toxicity of ethyl alcohol seems somewhat greater than that of methyl alcohol, it requiring a larger amount of methyl alcohol than ethyl alcohol to produce death by acute poisoning. It may be explained, that the acute form of poisoning is defined as that produced by giving in a single dose, sufficient of the alcohol to kill, in other words, the lethal dose. If, however, an amount of ethyl alcohol sufficient for a lethal dose, be divided into a number of doses and administered to the animals about ten hours apart, there will be no harmful effects produced.

Dr. Hunt states that if these small doses of ethyl alcohol be continued for two or three weeks, no harmful effects whatever will ensue; but that the animals will increase in weight, a ten-pound dog gaining as much as a pound in a week. A lethal dose of methyl alcohol, however, in all cases, administered in the same manner, caused harmful effects, with blearing of vision. If the small doses were continued for some time the animal became emaciated, the power of locomotion was lost, the vision bleared, followed sometimes by blindness, and finally death even though the alcohol had been discontinued.

In Reid Hunt's paper an explanation is offered and proof given for the difference in the action of the two alcohols on the human system. It is universally accepted that ethyl alcohol is oxidized in the body to harmless products, carbon dioxide and water; so it may be readily seen that, if not sufficient ethyl alcohol is given for a lethal dose, there is nothing to fear from its oxidation products.

That the full toxic action of ethyl alcohol takes place more quickly and wears off more rapidly than methyl alcohol, may be explained by its toxic influence depending entirely on itself, and not on its decomposition products; that it wears off quickly is probably due to its ready oxidation.

In the case of methyl alcohol, oxidation takes place more slowly, with the formation, not of harmless oxidation products, but harmful. The methyl alcohol is only partially oxidized, probably first into formaldehyde, then quickly to formic acid, which is probably neutralized with the production of formates, which are many times more toxic than methyl alcohol.

Pohl proved, by appropriate tests, that methyl alcohol is gradually converted into formic acid in the human system, as he established the presence of large amounts of formic acid in the urine, the excretion reaching its height about the fourth day; indicating the slow oxidation of the alcohol.

In regard to the assertion that it is the impurities of the commercial wood alcohol, which cause the poisonous effects attributed to methyl alcohol, this is controverted by the fact that in the experiments of Dr. Hunt, the chemically pure acted as energetically as the impure article. Also attention is called to the small amount of impurities existing in wood alcohol

with the exception of acetone, and to the fact that to obtain a poisonous dose of these impurities an amount of the alcohol would have to be taken that would cause death in itself. Up to this time we have only considered the action of the alcohols on animals, but in the experiments cited, it was observed that the higher nerve structures were more readily affected in dogs and rabbits, by the methyl than the ethyl alcohol, and in the experiments on monkeys this was more fully demonstrated. Man being the creation of the highest nerve power, it would seem that the toxic effect of methyl alcohol would be comparatively greater in man than in animals.

In proof of this theory, it may be sufficient to state that in some twenty authentic cases collected, the symptoms of methyl alcohol poisoning were essentially the same in man as in animals, with the difference of the more decided action on the higher nerve structures, notably the optic nerve. In most of the cases total blindness was produced before death, but in some cases blindness alone.

Many cases of death are known, caused by drinking ethyl alcohol, in the form of liquors, but in all cases it resulted from either an excessive draught taken at one time, or large successive draughts; yet many thousand cases are known of men who drink in small quantities continually and for years, with apparently no harmful effects.

Cases are reported of the drinking of methyl alcohol in large doses and death being produced; also of a number of cases of blindness and also death by the taking of methyl alcohol for several days or weeks, in small doses, such as would have had no bad effect if ethyl alcohol had been used.

These latter data have been obtained from persons who have used (as a beverage, or for intoxicating purposes) Jamaica ginger, peppermint, etc., containing this alcohol.

In connection with the above, it might also be cited, that there are on record, cases where blindness and even death resulted from exposure to the vapor of wood alcohol, one being that of two varnish-mixers, who were made blind by using wood alcohol in mixing paints. There is no doubt that some persons, usually robust, healthy men, may take wood alcohol for a time with more or less impunity, just as some men can resist a dose of opium that means death to another.

The facts above mentioned, not based on conjecture, but the careful experiments of careful and able men, indicate that there is no escape from injury, by the protracted use of methyl alcohol in any form.

Then, for the extraction of drugs or other pharmaceutical processes where the alcohol is finally eliminated, its use might perhaps be permissible, though even this use might prove dangerous (unless proper precautions are taken), as in the case of the two varnish-mixers.

Even if it be thought that there is not sufficient evidence to prove the greater toxic properties of methyl (due to its oxidation products) over ethyl alcohol, does it not seem a natural and proper precaution to have

the doubts cleared away by further, and exhaustive, investigation before considering such an important procedure as admitting it into the Pharmacopœia or even sanctioning it for any medicinal purpose?

The danger of sanctioning the use of such a substance, even in preparation for external use, may readily be seen.

There may be no direct danger from its external application, but there is danger in permitting what is looked upon as a harmless substance to go into the hands of the public containing some substance which, to say the least, is probably very harmful.

In the opinion of the author of this paper there seems no excuse for the use of methyl alcohol at the present time in any pharmaceutical preparation for internal administration.

If any pharmacist or manufacturer decides to take the responsibility and make use of this alcohol in any external preparation he should put it on the market labeled "poison."

It is gratifying to state that the information supplied by the pharmaceutical text-books and journals was decided sufficient in a recent court of justice to warn druggists and manufacturers of the harmfulness of methyl or wood alcohol, the medical text-book and periodicals being decidedly remiss on this subject.

On motion of Mr. Eberle, the paper was received and ordered referred for publication, and the Chair invited discussion on the paper.

MR. ELIEL: At the Minnetonka meeting—I think in 1897, if I am not mistaken—the Committee on Revision of U. S. Pharmacopœia for this Association brought in a report in connection with methyl alcohol. I was chairman of the committee at that time, and at my request a number of experiments were made by different people with methyl alcohol. One of these experiments was in connection with the manufacture of extracts, where the alcohol would be eliminated after extraction; and the reports that were gotten, and to which I would like to refer at this time, were decidedly in the negative. With some drugs the quantity of extractive matter was very largely increased. An examination of the finished product seemed to show that the active principles did not correspond in percentage strength with check preparation. In other cases there was a decrease, and in some an increase in alkaloidal matter. So that if methyl alcohol should be used for drug extraction, and afterwards eliminated, there would have to be a re-arrangement as to the dosage of the final product on account of different content of active principles. I take issue with the writer of this paper that it would be considered permissible, even for that purpose. I do not think that methyl alcohol should be used for drug extraction at all—at least not until we have had a great deal of investigation along these lines. I do not think it a good thing even for remedies that are used for external application, not until we know more about it. It would be a very good thing, with the high price of ethyl alcohol, if methyl alcohol could be used, but my experience leads me to believe it is not a good preparation for either internal or external use. It is certainly not a good thing for drug extraction.

MR. EBERT: A year before the Minnetonka meeting I was one of the Committee on the Progress of Pharmacy of the Illinois Pharmaceutical Association, and I was very much taken up with the idea that we had found a very excellent menstruum in methyl alcohol, especially as at that time these rectified spirits, or purified methyl alcohols, had

come into use; and I made a number of preparations for external use with them. I was experimenting somewhat along the line my friend Eliel has indicated, and reached about the same conclusion. I think it was shortly after the meeting at Minnetonka that I made some spirit of camphor, and the first lot I made I took a pint of it home. Mrs. Eliel is frequently troubled with severe headache, and on coming home one night I found her lying on the bed in a state of coma, with a cloth over her head saturated with this spirit of camphor. It was several hours before I could get her out of the stupor, but I have feared methyl alcohol ever since, believing that it was not safe to use it, internally or externally.

THE CHAIRMAN: I think probably Mr. Eliel misunderstood the views of the author. I think his idea is that methyl alcohol should not be recognized.

MR. HALLBERG: I remember when Mr. Eliel brought samples of tincture of iodine made with methyl alcohol to the Minnetonka meeting, some of it stood in a window in the sun for several hours, and the next day I happened to get hold of this particular bottle and drew the cork, and found that there was no stain of iodine worth speaking of on the cork. I then rubbed a few drops on my hand, and it left scarcely any stain on the skin; but it had a decidedly penetrating *ethereal* odor, and there was no question in my mind at the time that the iodine was shortly converted into methyl iodide, showing that we cannot use it for purposes similar to ethyl alcohol.

Mr. Payne, of Atlanta, then proceeded to exhibit and explain to the members the manner of operation of a dropper invented by Mr. W. D. Pitts, a young dispensing pharmacist of his city, who had just joined the Association, and pointed out its convenience of form and ease of operation, giving ocular demonstration of the slowness and rapidity with which medicines might be dropped from the vial to which it was affixed, and its seeming perfect control by the operator. In form it was a small glass tube of the proper length for a *four*-ounce vial, passing through the cork, with the upper end in two branches, turned at right angles and extending to a line even with the edge of the vial, so that it might be slipped in any carton that would hold the bottle. One branch was fitted with a small rubber air-bulb, while from the end of the other branch the medicine was delivered by pressure.

Mr. Wilbert said he wanted to warn the members against the use of any dropper for accurate dispensing, as a drop was never a definite quantity. Mr. Payne said he did not want to be understood as indorsing the drop, as such, for dispensing, but said that so long as physicians prescribed by drops it was desirable to have a good and convenient one, and he so regarded this.

Mr. E. A. Ruddiman then presented the following paper, upon which he was applauded by the audience.

## SOME INCOMPATIBILITIES OF A FEW OF THE NEWER REMEDIES.

BY EDSEL A. RUDDIMANN, NASHVILLE, TENN.

### AGURIN.

Agurin is readily soluble in water, not very readily in cold alcohol but more so in hot alcohol. The solution is strongly alkaline to litmus.

Adding hydrochloric acid to an aqueous solution of agurin does not give a precipitate at once. A dilute aqueous solution gives a bluish-white, gelatinous precipitate with silver nitrate which is soluble in ammonia water, but not in alcohol; the silver is not reduced on standing for several hours. With copper sulphate it gives a blue precipitate. Tartar emetic with considerable agurin gives a white precipitate. Lead acetate and cadmium chloride give precipitates. With mercuric chloride, magnesium sulphate, barium chloride, or platinum chloride, it does not give a precipitate at once, but does on standing. Ferric chloride with excess of agurin gives a red-brown precipitate. Excess of tincture of iodine causes little or no precipitation at once, but if the agurin is in excess the iodine is decolorized and a yellowish, gelatinous mass or thick liquid results which slowly becomes thin again and deposits a white precipitate. Carbon dioxide produces a white precipitate. An aqueous solution of agurin darkens calomel at once. It reduces potassium permanganate to some extent. It is not readily precipitated by Mayer's reagent. It precipitates solutions of many alkaloidal salts. Many of these precipitations are due to the alkalinity of the compound and can be prevented by first neutralizing the alkalinity. Rubbed with chloral hydrate, carbolic acid or piperazin, it gives a mass.

### ALUMNOL.

Alumnol is readily soluble in water but sparingly soluble in alcohol. The solution is decidedly acid to litmus. Adding ammonia to an aqueous solution gives a white precipitate which dissolves in excess of ammonia, giving a blue fluorescence. Potassium hydroxide acts like ammonia. Ammonium carbonate or sodium carbonate gives a white precipitate. With ferric chloride alumnol gives a deep blue color. It does not cause precipitates with lead acetate, silver nitrate, mercuric chloride, barium chloride, potassium mercuric iodide, or tincture of iodine. It precipitates albumin, the precipitate being soluble in excess of albumin.

### AMMONOL.

Ammonol is a white powder, part of which is soluble in cold water and part insoluble, soluble in hot water, not entirely soluble in alcohol even on boiling. It is alkaline to litmus, and when the bottle is freshly opened it has the odor of ammonia. If it is shaken with water and then filtered, the filtrate precipitates solutions of lead acetate, barium chloride, copper sulphate, silver nitrate, alum, ferric chloride, the precipitates being soluble on adding acids. This filtrate gives the odor of ammonia when heated with potassium or sodium hydroxide. Acids cause an effervescence. It probably contains ammonium carbonate. Most of the precipitations are due to the alkalinity and can be overcome by neutralization. When it is rubbed dry with resorcin, thymol, carbolic acid, or chloral hydrate it gives a mass or liquid. It does not reduce potassium permanganate appreciably.

### DIURETIN.

Diuretin is readily soluble in water. It is not readily soluble in cold alcohol, but is more so in boiling alcohol. It is strongly alkaline to litmus. The addition of acids to an aqueous solution causes a precipitation, probably of both theobromine and salicylic acid. Even carbon dioxide will give a precipitate. When a solution of diuretin is added to a solution of copper sulphate a green solution results if the copper is in excess, but a green precipitate if the diuretin is in excess. Silver nitrate gives a white gelatinous precipitate which is soluble in ammonium hydroxide. Calomel is darkened at once by a solution of diuretin. Mercuric chloride slowly gives a white precipitate. Diuretin gives a violet color with a tincture or solution of ferric chloride if the iron is in excess, but a red if the diuretin is in excess; the iron is not precipitated in either case. It precipitates solutions of alum and lead acetate. Ammonium carbonate, sodium phosphate, or borax slowly gives a precipitate with solutions of diuretin, but ammonium hydroxide, potassium hydroxide or Mayer's reagent causes no apparent change. Tincture of iodine is decolorized at first, but added in excess it gives a precipitate. Diuretin precipitates aqueous solutions of alkaloidal salts. When diuretin is triturated dry with chloral hydrate or carbolic acid it gives a soft mass.

### EUROPHEN.

Europhen is insoluble in water, soluble in alcohol, glycerin, and fixed oils. Heat and light tend to liberate iodine, particularly in solution. The solution in oil is of doubtful efficiency, since the iodine slowly liberated combines with the oil. It is not advisable to prescribe it with metallic oxides or salts that have a strong affinity for iodine.

### HEROINE.

Heroine is sparingly soluble in water, soluble in alcohol, chloroform, benzene, less readily soluble in ether and still less in amyl alcohol. Mixed with water it gives an alkaline reaction to litmus. It combines with acids to form soluble compounds. It deports itself very much like an alkaloid.

Heroine hydrochloride is very soluble in water, and is the salt most commonly used. Alkaline hydrates or salts precipitate it from aqueous solution, but the neutral or acid salts do not generally do so. Tincture of iodine or an aqueous solution of iodine with potassium iodide gives a brown precipitate. Potassium mercuric iodide gives a white precipitate. Dilute solutions of heroine hydrochloride with mercuric chloride do not give precipitates, but an excess of concentrated solution of mercuric chloride gives a white precipitate. From not too dilute solutions it is precipitated by chlorides of gold and platinum. Heroine lessens the fluorescence which quinine gives with dilute sulphuric acid. It interferes with the dichromate test for strychnine when it is present in considerable

proportion. Heroine hydrochloride and also the free heroine reduce potassium permanganate. Nitric acid gives a faint yellow which changes to green on standing, more quickly if warmed.

### ICHTHYOL.

Ichthyol is miscible with water or glycerin, precipitated by strong alcohol, neutral or slightly acid to litmus. It is precipitated by ferric chloride, ferrous sulphate, lead acetate, copper sulphate, alum, zinc sulphate, barium chloride, calcium chloride, magnesium sulphate; probably as sulphoichthyolates of the metals. From dilute solution it is not precipitated by mercuric chloride, tartar emetic, potassium iodide or sodium phosphate. Ammonium chloride, ammonium carbonate and sodium carbonate give turbidities. Acids combine with the ammonium, precipitating the ichthyolsulphonic acid. Silver nitrate slowly gives a precipitate. Ichthyol is decomposed by alkali hydrates or carbonates, liberating ammonia. It precipitates alkaloids from solutions of their salts, forming sticky masses.

### PHENOCOLL HYDROCHLORIDE.

Phenocoll hydrochloride is soluble in water. From not too dilute aqueous solution it is slowly precipitated by ammonia, ammonium carbonate and sodium carbonate; the precipitate may come down in flat crystals which refract light, but generally on standing the precipitate becomes brownish and amorphous. Mercuric chloride slowly gives a little white precipitate. Solution of ferric chloride gives a brownish-red precipitate, which becomes brownish yellow on standing; the precipitate is soluble in alcohol. Tincture of ferric chloride gives a deep red solution, which gets brownish-green in a few minutes, and some bubbles of gas are given off. Silver nitrate does not give a precipitate at once, but is reduced and deposited on the sides of the vessel in a few minutes. Gold chloride gives a dark brown precipitate at once, which gets nearly black. Platinum chloride slowly gives a green precipitate. Tincture of iodine in excess gives a brown precipitate, which redissolves in excess of phenocoll, and the iodine is decolorized. Piperazin sometimes gives a precipitate, probably due to the alkalinity of the piperazin.

### PIPERAZINE.

Piperazine is hygroscopic, soluble in water and alcohol, quite strongly alkaline to litmus. In aqueous solution it gives a brown precipitate with ferric chloride, a green one with ferrous sulphate, a white or nearly white with stannous chloride, mercuric chloride, tartar emetic, gold chloride, barium chloride or potassium mercuric chloride. Silver nitrate and platinum chloride give no precipitates. Tannic acid gives a white precipitate, which dissolves in excess of piperazine, giving a purplish color; adding more acid gives a permanent precipitate, but still more acid dissolves it with but little color other than that which the acid alone gives; if the solu-

tions are dilute precipitation may not result, but there is a change of color. Piperazine precipitates many alkaloids from solutions of their salts. Many of the precipitates mentioned above are due to the alkalinity, and will not occur if the piperazine is first neutralized. Tincture of iodine gives a nearly white precipitate. Potassium permanganate is reduced. It forms a liquid or mass when it is triturated with acetanilid, antipyrine, phenol, chloral hydrate or phenacetin.

### PROTARGOL.

Protargol is soluble in water, almost insoluble in alcohol, slightly alkaline to litmus. In aqueous solution it gives precipitates with lead acetate, zinc sulphate, silver nitrate, alum, ferric chloride, mercuric chloride, dilute hydrochloric acid, dilute acetic acid or quinine bisulphate. It does not give a precipitate with Mayer's reagent. It decolorizes potassium permanganate. It gives no precipitate with sodium or ammonium chloride or albumin.

### SALOPHEN.

Salophen is nearly insoluble in hot or cold water, somewhat soluble in alcohol, or ether, or chloroform. The alcoholic solution gives a violet color with tincture of ferric chloride if the salophen is in excess, but if the iron is in excess a red-brown color is produced; if the solution of salophen is previously heated and then mixed with the iron it gives a violet at once. Salophen is said to be decomposed by the alkaline fluids of the intestines. Potassium hydroxide aids its solution in water, probably decomposing it.

MR. HOPP: Mr. Chairman, I do not wish to discuss this paper, but has any one ever had any trouble in dispensing ichthyol in drop doses? I frequently have such prescriptions, and I can take seven and a-half drachms of ichthyol and add half a drachm of glycerin and make it quite liquid. Ten or fifteen drops of glycerin will prevent it from thickening up, and makes it all right for dispensing.

THE CHAIRMAN: Have your had any trouble in keeping it in your capsules?

MR. HOPP: I do not put it in the capsule; I give it to the patient and tell him how to use it.

THE CHAIRMAN: To dispense it in capsules would soften them very quickly.

MR. HOPP: Oh, yes; you could not keep it at all.

MR. ELIEL: I do not wish to criticise or make any remarks on this paper. It is a valuable paper, and gives a great deal of valuable information; but it seems to me that in this Section the information we want is chiefly that which is of practical value to the dispensing pharmacist, and I think that this paper should have been properly referred to the Scientific Section, not to this Section. As I understand it, this is the Section of Practical Dispensing. These reactions and examinations are of course of a great deal of value, but I think papers of this kind should be read before the Section on Scientific Papers; they do not belong here.

MR. MAYO: It seems to me the information contained in that paper is of eminent practical importance. If a man reads this paper he will find the cue to a great many incompatibilities that come up in prescription work.

Chairman Beringer then read a paper on Sapo Mollis, contributed by himself. The author exhibited and spoke of a number of preparations contained in vials as illustrative of his subject. The text of the paper, which was received with applause, here follows:

## SAPO MOLLIS AND LINIMENTUM SAPONIS MOLLIS.

BY GEORGE M. BERINGER.

These preparations are but seldom prescribed under their present official titles, but are almost invariably ordered under the names Sapo Viridis and Tinctura Saponis Viridis by which they were designated in the 1880 Pharmacopœia. Their introduction into medicine was due to German dermatologists. These early users were supplied with a soft soap possessing a decidedly green color, and yielding with alcohol a bright green colored tincture. As hemp-seed oil alone yields a soap of such color, I presume that this was the oil used in the manufacture.

A soft soap suitable for medicinal use should answer to the following requirements: A smooth, even, soft, unctuous mass, having a translucent, greenish-yellow color, soluble in alcohol and water to clear solutions and leaving only a minute, insoluble residue, and the filtered solutions should be clear and while moderately alkaline, must not be irritant from excess of alkali, and must possess strong detergent action.

A number of formulas for medicinal soft-soap have already been published, and the object of this paper is to present some experiments on the same subject. These formulas can be classified under two heads, namely, those made by the cold process and those made with the aid of heat, and generally with the addition of a moderate amount of alcohol.

The cold-process formulas are well illustrated by the following, which was given under the title "Sapo Viridis" in the first edition of the National Formulary.

Take of—

| | |
|---|---|
| Potassa | 8 parts. |
| Water | 12 parts. |
| Cotton-seed oil | 24 parts. |

Dissolve the potassa in the water, and while stirring the solution add the cotton-seed oil. Stir occasionally during forty-eight hours, then transfer to suitable vessels.

The product of this formula is not green at all, and has no claim to the title given. Moreover, it is subject to the very serious objection that it is entirely too alkaline, and this objection necessarily holds against all cold-process soaps.

The official formula for soft soap was undoubtedly copied after that in the German Pharmacopœia. The latter also recognizes "Sapo kalinus venalis" and the American market was formerly largely supplied with importations of this commercial grade. Hager (Pharmaceutische Praxis) states that "this commercial soft soap is a product of varying composition, being made from mixtures of rape-seed oil with linseed oil, train oil, hemp oil, etc., with a large excess of alkali, and frequently colored artificially by the addition of copperas, dyewood, indigo and other coloring materials to produce the color desired. Hemp oil produces a beautiful green without the addition of other coloring."

Following the official formula on a manufacturing scale, the writer was confronted with a practical difficulty, namely, that linseed oil *per se*, was not readily saponified, and in order to obtain a fair product the amount of potassa and alcohol used was greatly in excess of that directed. Yet, the entire replacement of linseed oil by some other oil such as cotton-seed oil, which has been proposed, may be objected to on therapeutic grounds, even if the latter did not present some objections that will be shown later.

Experiments were undertaken to determine the following points needed to establish a satisfactory formula: the oil, the correct amount of alkali to obtain a product sufficiently detergent and yet not irritant, the proper temperature and the amount of alcohol necessary to insure saponification and the yield.

My experiments led me to adopt the following formula:

Take of—

| | |
|---|---|
| Linseed oil | 40 Gm. |
| Malaga olive oil | 40 Gm. |
| Potassa | 19 Gm. |
| Alcohol | 10 Cc. |
| Water | 60 Cc. |

Warm the mixed oils on the water-bath to 70° C., dissolve the potassa in the water and warm this also to 70° C. and add this to the oils and stir thoroughly. Now add the alcohol and as soon as this is thoroughly incorporated stop stirring. Continue the heat at this temperature for a short time until saponification is complete, which is evidenced by the mass becoming clear and a portion dissolving in boiling water or alcohol without the separation of oil globules. The finished product will weigh about 140 grammes.

If the above directions are followed, the resulting soap is an almost transparent, smooth, greenish-yellow mass but if stirring is continued after the addition of the alcohol until the saponification is completely effected, then the resulting soap is opaque from included air.

Taking this as a fundamental formula. Samples of soap were made by substituting various other oils and mixtures. Of these the following are worthy of exhibition and comment: Malaga olive oil saponified with 10 Cc.

of alcohol, but cotton-seed oil, Lucca olive oil, linseed and hemp oils each required 15 Cc.

The cotton-seed oil yielded a soap that was transparent and almost colorless, and the liniment prepared from this in accordance with the official formula was pale yellow, almost colorless. Neither to this soap nor to its liniment would the official synonyms be applicable, yet these are the names used by prescribers.

The Lucca olive-oil soap and liniment were nearly identical in appearance with those from cotton-seed oil, being only a slight shade deeper in color.

The commercial or Malaga olive oil yielded a transparent yellow soap, having a faint green tint, and the tincture was likewise yellow.

Linseed oil yielded a greenish yellow soap, and the liniment, while yellow, had a distinct greenish tint.

A mixture of equal parts of linseed oil and Malaga olive oil, as recommended in the above formula, yielded a soap and liniment identical in color with those made from linseed oil.

Hempseed oil yielded a transparent green soap, and the liniment made from it was bright green. In odor and color this liniment closely resembles the tincture of green soap as originally imported.

*Detergency.* As the soft soap and the tincture, or so-called liniment, are both chiefly used for their detergent value, and not as a liniment or rubefacient, a comparison of the detergent strength of these tinctures was considered as an important factor in deciding the relative desirability of the soaps and the oil preferable for the formula. The writer was surprised to note the very marked difference in these tinctures in this respect; as, for example, .5 Cc. of the tincture from cottonseed-oil soap, shaken with 100 Cc. of distilled water, formed a foam which lasted only seven minutes, while .1 Cc. of the tincture from Lucca olive oil, similarly treated, formed a foam which persisted for five hours.

In order to make a comparative determination the following arbitrary test was adopted, and the six samples of tincture, all prepared by the standard formula, were subjected to exactly the same conditions.

To 100 Cc. of distilled water contained in a new, clean four-ounce vial 0.1 Cc. of the tincture is added from a pipette, and the vial corked and given five distinct shakes or jars with a wrist movement, and then set aside at rest and the persistence of the foam noted.

This simple test I believe to be practical and to give a fair indication of the detergency. The results are stated in the inverse order of the strength exhibited by the samples.

The tincture of cottonseed oil soap gave a foam which lasted only three minutes, and the water at once showed a cloudiness. After standing over night (12 to 14 hours) the water was quite cloudy, and on agitation failed to show any tendency to foam. The deficient detergent value of cotton-

seed oil soap should alone be sufficient to exclude it from official recognition.

The tincture from hempseed oil soap gave a foam which lasted for only three minutes. The water was cloudy at once, and this increased decidedly after standing twelve hours, when the solution showed only a slight tendency to foam.

Linseed oil soap held the foam for three hours, and after twelve hours' standing the water had become somewhat cloudy but was still slightly frothy.

The tincture from Lucca olive oil soap gave a foam which lasted for five hours, and the next day the water, which was at first clear, showed some cloudiness and only a slight tendency to foam.

With the tincture from Malaga olive oil the foam lasted six hours, and after twelve hours the water had become faintly cloudy but gave an abundance of foam on agitation.

The tincture from the mixed linseed oil and Malaga olive oil soap held its foam for ten hours, and after standing twelve hours longer showed but little cloudiness and gave very persistent foam.

All these aqueous solutions, after standing for twenty-four hours, showed some signs of decomposition, the water becoming more or less cloudy.

MR. ALPERS: Did I understand the author aright in thinking he said, in one part of his paper, that the soap made with hemp-oil was perfectly green, or did I misunderstand that?

MR. BERINGER: The sample is here—the sample made from hemp oil—and it is a bright green; and the tincture made from hemp-oil is also green.

MR. ALPERS: In New York we have been having a call for green soap, and there are a few dealers who manufacture a soap having a dark-green color. I know that a number of druggists have tried to produce such a soap, but without success. It is made by two or three manufacturers only, who keep their process a secret—at least, the coloring matter they use. The skin specialists use large quantities of it, and insist on that particular thing, and will not use the official-formula soap. Some years ago I tried to produce a soap of that character, but failed. Now, this soap is not colored with copper, or any other metal. I made a test for that and could find none. I tried methyl-blue, and got a beautiful green, but the next morning it was red. I have been very much interested in this paper, and if some means could be discovered for producing this dark-green soap it would be a great advantage to us, as these two or three manufacturers charge a big price for it.

MR. EBERT: Did you try it for oleate of copper?

MR. ALPERS: Yes, it was tested for that, and we could not find any.

MR. BERINGER: I quite agree with Mr. Alpers that many of our physicians will insist on having a green soap, and if the Pharmacopœia proposes to adopt a cottonseed-oil soap, or even olive-oil soap, we will have to keep both on hand, because the physicians will not have that article. This sample here is an old one, made from hemp oil, which gave it a bright-green color. I have very little doubt but that that soap on the New York market is made from hemp oil.

MR. ALPERS: But that is a dark, shining-green, far more pronounced in color than this.

MR. BEKINGER: This sample is ten years old and can hardly be expected to be as good as when fresh.

MR. HOPP: I have had some experience along the line indicated by Mr. Alpers, too. That soap is made by Frank Bagoe, of New York.

MR. ALPERS: That is the man; I did not care to mention him.

MR. HOPP: The physicians insist on having it because it is of a dark-green color and brought over from Europe.

MR. ELIEL: A good many years ago a German physician located in our little town, and he prescribed sapo mollis; or rather, sapo viridis. He said the sort of soap we had was not like soap he had been using, nor like the tincture: a very bright-green, he described it. I thereupon made quite a number of experiments to produce a nice green soap. My first attempt was by coloring the soft soap with chlorophyll green, made especially for coloring soaps and fats, and I found that fairly permanent; but the doctor said, no, that was not like the soap he had been getting in Germany. So I went on experimenting, and finally settled on green Malaga olive oil, and made the soap from that. That pleased the doctor. I have been making it ever since. I make possibly 200 or 250 pounds a year, supplying different doctors and physicians in our neighborhood, as well as some hospitals. The formula I use I gave the committee at the Denver meeting in 1895, and you will find it in the report for that year.

MR. EBERT: I would like to call the Chairman's attention to the fact that if he would use cocoanut oil for his soap he would succeed in making a more detergent article than he has produced.

MR. BERINGER: I am acquainted with that, but it has a rank odor. No matter how the soap is made, you cannot cover up the odor of the cocoanut oil, and I think that would be disagreeable. I think if Mr. Alpers will try hempseed oil, added to the green olive oil, he will probably get the coloring desired.

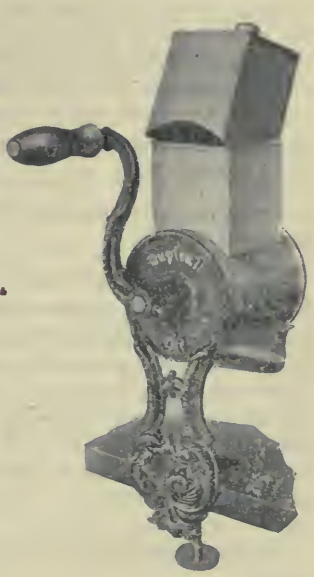
MR. REMINGTON: I have heard that a small quantity of potassium dichromate added in the making of soap will produce a shade of green that is permanent. It seems unfortunate to have to add anything to any kind of soft soap to sell it. If the physicians have the idea that the green color adds to the value of soap, it seems to me it is time they were learning the truth.

MR. KEBLER: There is no difficulty about making soap according to the United States Pharmacopœia's directions, in my experience. I made considerable of this soap when I started out in manufacturing. I started with 200 pounds of linseed oil. I was very careful that the potash was clear and transparent, free of that whitish appearance. The exact quantities I do not remember. I did not use alcohol to dissolve the oil; I found it was entirely unnecessary. I simply ran a solution of a certain strength made up according to the Pharmacopœial directions into the mixture of oil and water, with constant stirring, at a heat of 90 degrees Centigrade, and I had no trouble. Soap can be made in that manner from 8 in the morning to 5 in the evening without trouble. The difficulty I met with in the drug trade was, that they wanted dark soap, that is, brownish, and I got that by heating it for some time in a vessel, which gave it the desired color.

The chair stated that Mr. Ebert would now make some remarks upon the subject of

## GRANULATED OPIUM.

I come before you with a device that I have found useful in granulating opium. This machine, known as the "Duplex," is an almond grater, and intended as a utensil for the the kitchen. It is of German manufacture, of very simple construction, readily taken apart and easily cleaned. It costs about $1.00, and is obtainable in Chicago in hardware and household-furnishing stores. In speaking to Professor Hallberg about devices that I had employed for the granulating of opium he mentioned that they had an apparatus in the pharmaceutical laboratory of the Chicago College of Pharmacy that he used for grating soap for soap liniment and granulating cacao butter in making suppositories, and that it might answer the purpose of granulating opium. He requested me to give it a trial, which I did, and was more than pleased at the result. As granulated opium is likely to become an official preparation of the coming Pharmacopœia, its ready production is of importance to the pharmacist.



I have here crude opium, which was cut into slices by the aid of a pair of shears and then air-dried. I place these pieces in the hopper. If the crank is turned to the right it will produce a fineness of about twenty meshes to the inch, and if turned to the left its fineness will be about ten meshes to the inch, thus producing a form of opium of a fineness that will answer the purpose of making liquid preparations of this drug much better than when the present official powdered opium is used. In my experiments in the manufacture of deodorized opium and its tincture, which appeared in the "American Journal of Pharmacy" for April, 1902, I employed this form of granulated opium, and found it answered the purpose exceedingly well.

If I may for a moment be allowed to digress, I would say that my method of procedure in making deodorized opium is as follows:

Take a glass funnel having double the capacity of the quantity of opium to be operated upon, cork up tightly the lower end of the stem, but so that the cork can be removed when desired, and having placed in the funnel a plain folded-double filter, put into it the granular opium, press down slightly, and pour upon the opium sufficient benzin of a high and purified grade to cover. To prevent evaporation of the benzin cover the top of the funnel, let stand over night, then withdraw the cork from the stem of the funnel and allow the liquid to run into a container. Repeat the operation until the benzin takes no more color from the opium. Now remove the filter containing the opium from the funnel and spread the opium out to dry. The benzin extracts from the opium from two to three per cent. of matter, consisting largely of caoutchouc, wax, and oily and odorous matter. I have here samples of the deodorized granular opium and the extracted matter.

This extracted matter contains the objectionable noxious ingredients present in opium, and should be removed from all the liquid preparations of this drug. A mistake is made, however, in the present official process for making deodorized opium by employing ether, as this solvent not only removes the noxious principles, but also the alkaloid, *narcotine*, which is a valuable and beneficial principle, and not a noxious one, and should be retained in all preparations of opium. As narcotine is not soluble in benzin it is not removed when opium is deodorized by this solvent, and we hope that the Committee of Revision of the U. S. P. will substitute benzin for ether in the process.

Reverting again to the granular opium thus purified we have a form of opium which can readily be extracted by the ordinary solvents, water and alcohol. However, the preparation that has been shown us at this meeting as a fluid extract of opium made with acetic acid, prepared by E. R. Squibb & Sons, is, in my opinion, an ideal preparation of opium. I heartily endorse the use of an acetic menstruum for the extraction of the drug, as it removes all the alkaloids, including narcotine, of which there is five to eight per cent. present, and which is but partially extracted by water or alcohol.

Let us for a moment stop and look backward at the history of opium. The acetous preparations of this drug are as old as the drug itself. No doubt they were equally well known to Homer and Paracelsus, and later were in great favor with the medical profession as *Lancaster* or *Quaker's Black Drop*.

I hope that the paper presented to us by Mr. J. Percy Remington at this meeting, on "Acetic Acid as a Menstruum for Extracting Drugs," will receive the careful consideration that it deserves by the Committee of Revision of the U. S. P., for I must confess that I am a convert to the use of acetic acid as a solvent for the active medicinal principles of many drugs.

THE CHAIRMAN: The Chair would like to ask Mr. Ebert if the use of benzine leaves any odor?

MR. EBERT: The use of benzin, I might say, does not leave any odor in the granulated opium if a high grade of benzin be employed. I always make use of what is known in the market as gasoline, of 87 degrees and 88 degrees Baume. This high grade is not very readily obtainable in less quantity than in barrel packages in the market. That which is sold as gasoline or benzin by the gallon by dealers in petroleum products is what is known as stove gasoline, and has a gravity of 67 degrees Baume, and is not of such quality and purity as to fit it for pharmaceutical uses. I usually obtain the purified article from some manufacturing pharmacists, who kindly supply me with several gallons of this grade.

In the absence of the author, the Secretary then read the following paper:

## FORMULÆ FOR CARBON TETRACHORIDE CLEANING FLUIDS OR NON-INFAMMABLE BENZIN OR SAFETY BENZIN.

BY OTTO RAUBENHEIMER, PH. G.

From the facility with which benzin, naphtha and gasoline remove grease spots from fabrics, these substances have become a household necessity. But few persons, however, realize the explosive character of benzin, naphtha or gasoline or the dangers attending the careless handling of these liqulds. Being the most volatile and inflammable products, resulting from the distillation of petroleum, they vaporize with great rapidity, so that the contents of a four-ounce vial, if upset, will render the air of a moderate sized room highly explosive. The greatest care has to be exercised in handling these substances near the fire or flame, and it is reported that the vapor arising from an uncorked bottle will cause a flame to leap over a space of several feet. On account of so many fires, due to the careless handling of benzin, etc., an ordinance was passed in Greater New York, to take effect January 1, 1903, allowing no more benzin, naphtha and gasoline to be sold. The pharmacists for the time being were puzzled what to sell in place.

About the middle of December I started in to combine benzin with something so as to make it non-inflammable and non-explosive. My first successful attempt was the admixture of chloroform. I found that by mixing 2 volumes chloroform and 1 volume benzin I got an excellent cleaning fluid for removing stains. This mixture will be safe, and will not ignite if a lighted match, for instance, is put to it; in fact the match will go out if dipped into the liquid. The price of chloroform being 60 cents a pound, or 45 cents by the 100 pounds, owing to a combination of the manufacturers all over the country, I had to abandon the chloroform cleaning fluid. Besides this, chloroform always contains about 1 per cent. alcohol, and alcohol in a cleaning fluid will affect the aniline color of fabrics.

During this time I talked to different pharmacists about my work to make benzin non-inflammable. They all considered it an old chestnut, and said they could make it so by adding a little common salt. One man was so sure about it that he was willing to bet money. Of course the salt addition was a perfect failure, and I have learned since the reason how this idea spread around. About 1870, when kerosene oil was not quite as well refined as it is now, and did not have a flash test of 150° F., numerous lamp explosions caused several parties to put up small packages of ordinary salt, which was colored, and sell them at a fancy price. The salt was to be put into the kerosene oil, and was supposed to prevent the lamp from exploding. Of course it was a fraud.

After chloroform I tried carbon tetrachloride. I found it quoted in Eimer & Amend's price list at forty-five cents a pound, but could at the time only obtain Merck's at two-dollars a pound. Carbon tetrachloride is a very heavy, colorless, transparent, mobile liquid, with neutral reaction. Its taste is pungent, aromatic and cooling, but not sweet like that of chloroform. Its odor is agreeable and aromatic, resembling that of chloroform, but not sweet. It is very volatile, even at low temperature. It is absolutely non-inflammable and non-explosive. Its vapor does not support combustion, but acts as a fire extinguisher. It has a specific gravity 1.6 and a boiling point 77° C. I found two volumes of carbon tetrachloride and one volume of benzin a safe mixture, which when poured in a dish and a lighted match put near it will not ignite. This liquid is perfectly safe to use around the light or fire. In order to disguise the benzin odor I use one or two drops of methyl salicylate to each ounce.

It must be borne in mind, that such a mixture, whilst non-inflammable at ordinary temperatures, will burn when heated, because the carbon tetrachloride evaporates first and then the benzin will ignite.

The name, "Non-Inflammable Benzin," in this case is actually a misrepresentation, and I therefore have adopted the name "Safety Benzin." Also see my papers.*

* Experience with Non-Inflammable Substitutes for Benzin, read before Kings Co.

In making different mixtures of carbon tetrachloride and benzin, it should be remembered that as long as you have any benzin present, the mixture will burn, the more benzin the more readily will it burn.

An absolutely non-combustible, or non-burnable and non-explosive cleaning fluid, which can be guaranteed as such, is carbon tetrachloride by itself, without any addition. When used as a cleaning fluid it should not contain any alcohol, as same will affect the color of goods dyed with aniline.

The advantages of a "Carbon Tetrachloride Cleaning Fluid" or a "Safety Benzin" are the following:

1. It does not injure the texture of the finest and lightest fabric.
2. It does not injure the most delicate vegetable, mineral or aniline color.
3. It does not leave any odor, but will entirely evaporate.
4. It does not leave any marks around the edges of the spots.

From numerous experiments I have made in this line, I also beg to state that it does not remove stains caused by red wine, fruit, ink, iron and rust, tannin, blood, albumen, glue, sugar and syrup, but will remove any other stain, even a very old one.

Carbon tetrachloride is at present not manufactured in the United States, but is imported from Germany and France, 25 per cent. ad valor. duty on the same. No doubt if there is enough demand for it, then it will be made here. The chemical factories manufacturing carbon disulphide can, without very much trouble and expense, make carbon tetrachloride by passing dry chlorine gas into carbon disulphide contained in a retort. A very slight heat is applied and the vapors of chlorine and carbon disulphide are passed through a porcelain tube wrapped in sheet copper, filled with pieces of porcelain and kept at a bright red heat. Carbon tetrachloride and sulphur chloride are thus produced:

$$CS_2 + 3Cl_2 = CCl_4 + S_2Cl_2.$$

The vapors are condensed in an iced receiver and the result is a yellowish-red liquid, a mixture of $CCl_4 + S_2Cl_2$. The latter is removed by slowly adding an excess of potash lye or milk of lime, the mixture being set aside and agitated from time to time till the sulphur chloride is decomposed and dissolved. By distillation carbon tetrachloride passes over and can, if necessary, be entirely freed from carbon disulphide smell by further treatment with an aqueous (not alcoholic, as same will decompose $CCl_4$) solution of potassa or soda.

The price of carbon tetrachloride at present is 25 cents a pound or 20 cents in large quantities. The cost of my safety-benzin is:

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Pharm. Soc., Mch. 10, 1903; published in Pharm. Era, vol. xxix, No. 12, fol. 257, Mch. 19, 1903; condensed in Merck's Rep., vol. xij, No. 4-91, April, 1903; and Composition of Benzin Substitutes, published in Am. Drug., vol. xlii, No. 6, fol. 168, Mch. 23, 1903.

| | |
|---|---|
| Carbon tetrachloride, 1 pound, about 10 fluid ounces | 25 cents. |
| Benzin q. s. ad Oi | 5 cents. |
| Bottle | 5 cents. |
| Total cost per pint | 35 cents. |

I sell same at 50 cents per pint, 30 cents per one-half pint and 15 cents per 4 fluid ounces. It gives excellent satisfaction to my customers.

MR. MAYO: This subject is one that attracts a good deal of attention locally in New York City, on account of the stringent measures taken there by the Department of Combustibles. When the measure went into effect prohibiting the sale of benzin in drug stores, there was a suspicious degree of readiness on the part of several manufacturers to take advantage of it, and even a suggestion that they had instigated the ordinance. An acquaintance of mine, before the ordinance went into effect, told me he had discovered this property of carbon tetrachloride, and showed me what he said was a mixture of benzin and carbon tetrachloride. I published a note about the use of carbon tetrachloride, and was overwhelmed with inquiries as to the sources where it could be obtained. I do not know any cheap source in the United States, though the manufacturers do put it out under the name of pyranzine, a substance which has all the physical qualities of the carbon tetrachloride. Quite recently, the German technical journals have devoted a good deal of attention to the use of carbon tetrachloride as a solvent in technical operations, and over there it sells at about seven cents a pound, and it has been exploited in Germany very largely to take the place of benzin. It has the advantage of being non-inflammable and cheap.

MR. KEBLER: A few years ago I took this matter up, relative to the possibility of utilizing this product for manufacturing purposes, especially because of the fact that benzin was not allowed to be used for many purposes within the city limits, and on account of the high rate of insurance. I found, on trying to get the product, that there was virtually none available in this country. I, however, succeeded in getting about fifty pounds, and the price was fifty cents a pound. The results were quite satisfactory, and if you could get it for seven cents a pound, as indicated by Mr. Mayo, it would be a very useful product. A manufacturer in Philadelphia told me, during a conversation several years ago, that this product was used in benzin to diminish the inflammability. It makes it safer to handle, and reduces the insurance rates.

The Chair announced that the time had now come for the further nomination and the election of officers of the Section for the ensuing year, and read a list of the nominations made at the first session, viz.: For Chairman, Mr. W. H. Burke, of Detroit, and Mr. Charles W. Benfield, of Cleveland; for Secretary, Mr. E. A. Ruddiman, of Nashville, and Mr. Frank E. Fisk, of Chicago; for Vice-Chairman, Miss Jean Gordon, of Chicago; Mr. William Mittelbach, of Missouri, and Mr. D. F. Jones, of South Dakota.

A motion made by Mr. Ryan to proceed to the election of officers was carried.

The Chair called for other nominations for Chairman, but none were made, and, on motion of Mr. Hopp, nominations for this place were closed.

The Chair called for other nominations for Secretary and Vice-Chair-

man, but there was no response, and, on motion, the nominations were closed.

The Chairman appointed Mr. E. M. Boring and Mr. Otto F. Claus to take the vote.

Mr. Hopp announced that Mr. C. W. Benfield desired to withdraw his name from nomination for Chairman, and moved that the tellers be instructed to cast the vote of the Section for Mr. W. H. Burke for that office, which motion was put and carried.

Mr. Boring stated that the tellers had cast the ballot as directed, and the Chair declared Mr. Burke duly elected Chairman of the Section on Practical Pharmacy and Dispensing for the ensuing year.

The Chairman suggested the taking of the ballot for Secretary and Vice Chairman at the same time, but Mr. Schlotterbeck moved to ballot for Vice-Chairman first, and it was so ordered.

On motion of Mr. Eliel, it was ordered that if the ballot showed no candidate receiving a majority of the votes cast, there should be no election, and that another ballot should be taken, dropping the candidate receiving the lowest vote.

The result of the first ballot for Vice-Chairman showed a total of 43 votes cast, of which Miss Gordon received 21, Mr. Mittelbach 16, and Mr. Jones 6.

Under the rule adopted Mr. Jones' name was dropped, and a second ballot was taken, showing the same total vote (43), of which Miss Gordon received 31 and Mr. Mittelbach 12, and the Chair declared Miss Jean Gordon elected Vice-Chairman of the Section for the ensuing year. [Applause.]

The Chair then directed the tellers to take the vote for Secretary, and the result showed 43 votes cast, of which Mr. Ruddiman received 36 and Mr. Fisk 7, and the Chair declared Mr. E. A. Ruddiman duly elected Secretary for the ensuing year. [Applause.]

The Chair then called for the regular order, and said there were yet three papers before the Section unconsidered, viz.: one on the subject of "Waste, and How to Prevent It," by Mr. Wm. Mittelbach, of Missouri; one on "Pharmaceutical Fragments," by Mr. W. W. Kerr, of California; and one on "Incompatibility in a Prescription for Pills," by Mr. E. Fullerton Cook, of Philadelphia.

Mr. Mayo moved to read by title only, in the absence of the authors, and refer to the Publication Committee, which motion was seconded by Mr. Voss, and carried.

## WASTE—AND HOW TO PREVENT IT.

BY WILLIAM MITTELBACH, BOONVILLE, MO.

The old saying, "take care of the little things, and the big ones will take care of themselves," is especially applicable to the drug business.

rough hands of the apprentice and unannoyed by the accumulating dust of ages.

Empty corners and small wall spaces in your store can be utilized for many purposes, by building in such space small closets or shelving.

Besides the things enumerated in this paper there are other small things, which, if properly looked after, will become a source of revenue. Above all profits or savings accruing from such system, is the splendid and valuable training our young men get, that will be of benefit in their future.

## PHARMACEUTICAL FRAGMENTS.

BY W. W. KERR, FULLERTON, CAL.

*Tincture of Opium.*—The difficulty of percolating the mass in making this preparation has called forth a number of suggestions from various sources, looking to the remedying of the trouble, all of them either falling short of success, or accomplishing it only by the introduction of an objectionable remedy.

The U. S. P. of 1880 prescribed that the powdered opium should be triturated with hot water, allowed to macerate for twenty-four hours, the alcohol added, and the whole placed in the percolator, returning the first portions until it came through clear. The difficulty in following these directions was, that as soon as the drug had well settled, it became so compact that long before the operation was complete, the flow would cease, or so nearly so that too much time was required to complete the process.

To obviate this trouble it was proposed by some to use only a standardized, granular opium, but in this case if the pharmacopœial directions were followed, the mass resulting from the trituration with the hot water, would be as difficult of percolation as by the official process.

To overcome this it has been suggested to macerate the granular opium with dilute alcohol for a given length of time, and then percolate. To this arises the objection that it but very imperfectly relieves the difficulty alluded to, and besides it furnishes a solvent very much inferior to hot water for dissolving out the contained alkaloids—a serious objection. The U. S. P. of 1890 effects the object by triturating the powdered opium first with calcium phosphate and afterwards with the hot water, and then proceeding as in the 1880 process. This overcomes the difficulty of tedious percolation, but it introduces an intervening distributing medium which is always objectionable when it can be avoided, as it can in this case. For several years I adopted a plan of placing over the absorbent cotton inserted into the neck of the percolator, a perforated diaphragm made by punching a number of holes in the lid of a tin ointment box of suitable size, upon which was poured the mixture of drug and menstruum. This left little to be desired, as half a gallon of the tincture would easily run through inside of twenty-four hours.

In recent years I have improved on this plan by simply overlaying the

a friend out of him. He will not forget you when he wants to buy something.

The *wooden boxes* in which you receive drugs, patents, etc., should be classified and stored away for use. When unpacking your goods have the clerk open the boxes carefully so as to avoid breaking the lids. When empty tack the lid on again, and the box is ready for storage. They should be classified by sizes in order to save time when getting one. In stores that have any farmers' trade there is a demand for empty boxes nearly every day. They cost you nothing, and are appreciated very much by those in need of them. Should the boxes accumulate too rapidly for you, you will have no trouble in disposing of them for kindling wood.

The *nails* extracted from the boxes should be sorted and put away in a dry place for future use. We are all nail-drivers to a more or less extent, and will appreciate our own thoughtfulness in saving them for use at the proper time. The surplus give away to those who will take them. You will have no trouble in finding some one who will be pleased to receive them.

*Journals* should be bunched in volumes. Those you use for reference have near your desk; and those not in use, file away in dust-proof boxes or book-cases. Some one will want them, and be thankful to you for saving them.

*Price lists* ought to be kept in a secure and handy place. It doesn't take much space to hold the lists for 5 or even 10 years. Once in a while we have occasion to refer back some 4 or 5 years for prices or other information. It may mean dollars and cents to us, if able to lay our hands on such lists. In stores doing a large business the saving of old *tin-foil* bottle caps and wrappers will create a revenue, greater perhaps than the average druggist imagines. There is a ready demand at all times for old tin-foil.

Properly assort the *advertising matter* you get and promptly distribute in your neighborhood. Don't store it under the counter or consign to the waste barrel. If opposed to the distribution of such matter from your store promptly notify the firms issuing the same of your position in the premises not to send you any more hereafter. They will appreciate this very much and think more of you. Advertising matter these days costs money and ought not be wasted.

*Labels* are a source of waste if not properly bought and looked after. Store the surplus in dust-proof boxes to keep them clean and fresh looking. Soiled by dust and stained by light and exposure they are soon unfit for use. Out-of-style labels are not nearly so objectionable as soiled ones.

In the course of time *text-books* and other works of reference become old and are displaced by later editions. File them away in dust-proof closets or book-cases. If you leave them lying around they will soon be ruined, and the loss is complete. Pension your old friends by providing a nice, clean place for them where they may rest in peace, free from the

rough hands of the apprentice and unannoyed by the accumulating dust of ages.

Empty corners and small wall spaces in your store can be utilized for many purposes, by building in such space small closets or shelving.

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In recent years I have improved on this plan by simply overlaying the

cotton with a thick layer (say one inch) of well-washed sand, which allows the menstruum to pass through, from start to finish so rapidly that it becomes necessary to regulate the flow.

*Ointments.*—My experience teaches me that the difficulties so often complained of in making these preparations is due solely to the kind of lard used, always assuming proper manipulation. I have observed that usually, when the operator wants any of this article, he posts a boy to the nearest grocery store to get a can of somebody's "absolutely pure leaf lard," and with it makes up the ointment wanted at the time. If that should be, for instance, oxide of zinc ointment, he is disgusted a few months later, on opening the container, to find that his preparation has become granular, or, possibly, even semi-fluid, with the oxide of zinc partially or entirely separated, and perhaps he will, mentally at least, hurl his anathemas at the Pharmacopœia as the cause of all his trouble, when the fact is, it lies only at his own door.

It is well known that the lard manufactured for the general market has been hydrated to its utmost capacity, and even if the water is carefully driven off, it still remains that it has been made from other of the fatty parts of the hog besides the leaf-fat, and is not official adeps, and not fit for pharmaceutical use.

The remedy, and the only remedy, for these troubles is in going to the butcher and buying the true leaf-fat and rendering it yourself, and there need be no trouble in making the official ointments, or in their keeping qualities.

## INCOMPATIBILITY IN A PRESCRIPTION FOR PILLS.

BY E. FULLERTON COOK.

℞ Sodii bicarb.
Hyd. chlor. mitis, aa.....grs. x
Ext. rhamni pursh.....ʒss
Aloini.....grs. iv
Mx. ft. pil. No. xx.

This prescription was filled by triturating together the aloin, sodium bicarbonate and calomel, then adding the solid extract of Cascara sagrada, massing the whole, and dividing it into the required number of pills. The mass at first seemed to possess all of the qualifications needed for a satisfactory pill, but even while making it into a uniform mass it began to soften, and when the pills had been cut and rolled they soon became swollen to twice their normal size, and gave every indication of a reaction taking place in the pill, in which carbon dioxide was liberated.

In pills containing the same proportion of aloin, sodium bicarbonate and calomel, but with the extract of Cascara sagrada omitted, no similar reaction was noticed. This reaction is supposed to be due to the presence of resin-like bodies in Cascara sagrada, which react with the sodium bicarbonate as acids, and liberate the carbon dioxide. If the presence of

the sodium bicarbonate is essential, therapeutically, the prescription could be filled by using powdered extract of Cascara sagrada, and when all of the ingredients have been uniformly mixed, dividing the whole into the proper number of capsules, filling by the dry method.

An additional suggestion for the filling of this prescription would be its division into two parts—the calomel and sodium bicarbonate made into one pill and the aloin and extract of Cascara sagrada made into a second pill, although in either case the permission of the physician should be obtained.

THE CHAIRMAN: We also have a number of queries that have been propounded, and suggestions made, and prescriptions and so on, which should be published in the Proceedings, and the chair will entertain a motion to edit and publish in the Proceedings.

On motion of Mr. Voss, it was so ordered.

At request of the chair, Mr. Hopp then presented the following notes upon practical dispensing, with copious explanations and illustrations of his several subjects, exhibiting some handsome specimens of his hard-filled capsules treated with dilute alcohol as described for making a tight joining of the two parts, as also his extra-heavy suppository moulds, with specimen suppositories.

## NOTES ON PRACTICAL DISPENSING.

BY LEWIS C. HOPP.

*Hard-Filled Capsules.*—Why dispense soft-elastic capsules—which have the appearance of factory-make or resemble proprietary preparations—when hard-filled capsules can be easily filled and joined together without resorting to the cumbersome plan of using a camel's-hair pencil dipped into water, etc. I have used a very simple method with entire success and served out, in my opinion, an elegant-filled capsule. In the summer I use diluted alcohol; in the winter, the mixture of three parts alcohol and four parts water. In filling a capsule, place your diluted alcohol in a small, shallow receptacle—the lid of a half-ounce tin ointment-box answers very well—place the upper half of the capsule upright in the alcoholic solution. In your left hand, with thumb and index finger, hold lower half of capsule, fill with whatever oil desired. When filled, pick up the top of capsule out of alcoholic solution, give it a flirt to remove excess of liquid, place over the lower half of capsule, push down and give it a turn while so doing, then set aside, and in a very few minutes you will have a perfect-joined capsule.

*Suppositories.*—The making of these seems to be one of the stumbling blocks to the average pharmacist—especially when making suppositories by heat and the mould, whereas this is the only true way to make suppositories, and I would ten times rather make suppositories than a batch of pills. I will now try to show you wherein the trouble lies. In the first place I have never seen a mould that contains metal enough to hold the

required amount of cold required to bring about a quick contraction when the mass is poured into the mould. This is the first trouble, instead of the mass contracting from the mould toward the centre it congeals from inside or centre of suppository toward the mould, and when this occurs the result is suppositories adhering to mould. By using a large, heavy mould, the cold is retained and the mass at once contracts from the mould towards the centre, and in making large quantities of suppositories I have two moulds, and after they are thoroughly chilled we can run off suppositories just as fast as we can by filling first one and placing on the ice, the second one is then filled, placed on ice and the first one is emptied and filled, never having occasion to use any pressure, or the removing of a clamp on the moulds, which is not only a nuisance, but takes too much time.

The mould I here show resembles the moulds usually sold, with the exception that it is very much larger and heavier, weighing seven pounds, and requiring no clamp, as the weight of the metal is sufficient to hold them together.

Another trouble is with extracts. All text-books state reduce your extracts to a paste, now that will surely give you trouble. Solid extracts should always be brought to the consistency your cocoa butter is when melted, which means it should be as fluid as a fluid extract. If it is not it will invariably separate.

*The Mixing and Sifting of Powders.*—In the prescription department, the dispenser will save time, also more thoroughly mixing a combination of powders by sifting the same after thoroughly triturating. We use a shallow, porcelain mortar, without lips, and a pestle which is flat at the bottom, similar to the large mortars used by manufacturers for triturating powders in the manufacturing of T. T. This mortar has proved so successful that we rarely use a wedge-wood mortar for powders and in majority of cases prefer it in making pill masses.

After powder is thoroughly triturated in the mortar it is put into a sifting arrangement made by placing a piece of tarlatan, using a mesh, fine or coarse, to suit the operation, on the top of a museum jar, such as W. T. & Co. make, allowing the tarlatan to sag down about one inch, secure same around top with a rubber band. Place powder on tarlatan so arranged, put glass cover on top of jar, and with firm grip of the hand—or using the iron clamp used for fastening down the cover—shake up and down. In this way the powder is quickly sifted without any loss or dust floating through the air. When it is desired merely for mixing purposes, a quite coarse-meshed tarlatan is used.

MR. ELIEL: I am very glad, indeed, we prevailed on Mr. Hopp to read that paper at this time. I should have regretted to wait a year to get some of the points he makes, that, to me, at least, are very valuable. I consider that method of preparing the lid of the capsule to be a very good one, and certainly very much better than the method which

has been in use in our store, viz., that of brushing the inside of the lid with a camel's-hair pencil. Of course, by that method, as Mr. Hopp says, the prescriptionist may get a little more water than is necessary, and the result will be a leaky capsule. I can also readily see the advantage of this mould for making suppositories that he has shown us, though, many years ago, I abandoned moulds for that purpose. We have found that a pressing-machine is the ideal way to make suppositories, although sometimes we go back to the old way of making them by hand.

Mr. Mayo asked Mr. Hopp if he put the capsule-tops in the dilute alcohol a dozen at a time or singly, and Mr. Hopp said one at a time—that to leave the edge of the capsule-top in the liquid during the time it would take to fill the capsule was sufficient to soften it to the required degree for a perfect joining. Mr. Hopp also said, in answer to a question by Mr. Voss, that the filled and sealed capsules were laid flat, and not set upright.

On motion, the paper was then referred for publication.

The Chair then asked if there were any other business, or any other communications to bring before the Section, but nothing was offered.

Chairman Beringer then introduced to the Section its Chairman-elect, Mr. W. H. Burke, the retiring Secretary, now at his side, in the following words:

Gentlemen, it affords your Chairman a great deal of pleasure to introduce to you your Chairman for the ensuing year. Mr. Burke is well acquainted with the duties of the Section, having been your Secretary this year, and is well known to you. His efficiency is recognized, and I think we are fortunate, indeed, in having secured a practical pharmacist as Chairman of the Section.

Mr. Burke: Mr. Chairman and members of the Section on Practical Pharmacy and Dispensing, I wish to thank you for the honor you have conferred upon me. This Section has already done a great deal of work, but there is plenty of chance for it left, and my hope is that the members will be as ready to respond as your Chairman is sure to ask for assistance in preparing an interesting programme for next year. Gentlemen, I thank you very kindly. [Applause.]

Mr. Burke then took the chair.

The Chair asked Mr. Cliffe and Mr. Voss to be a committee to conduct the new Vice-Chairman, Miss Jean Gordon, of Chicago, to the stand, and these gentlemen performed that very agreeable duty. Mr. Cliffe then said:

Mr. Chairman and Members of the Section: I take great pleasure in introducing to you Miss Jean Gordon, of Chicago, who has been duly elected Vice-Chairman of the Section. She really needs no introduction to this Section, because her ability is known and recognized not only in Philadelphia, where she secured her pharmaceutical education, but also in the city of Chicago, where she practices it. [Applause.]

Miss Gordon: Mr. Chairman and Gentlemen: I thank you for the honor conferred on me, and can only say that I shall make an effort to do what will be best for the Association at its next meeting. I hope you will be patient and lenient with me if I do not do a great deal. I thank you kindly. [Applause.]

The Chair asked the same gentlemen to bring the new Secretary forward, which they did, and Mr. Voss introduced him to the Chair. The Chairman then said :

Mr. Ruddiman : I am very glad, indeed, to have so able a man as an assistant on this Committee, and I take pleasure in introducing you to the Section. Gentlemen, Mr. E. A. Ruddiman, your new Secretary !

MR. RUDDIMAN : Mr. Chairman and Gentlemen : I thank you most heartily for this honor, and I am particularly fortunate in having elected with me at this time such an efficient Chairman. He has been Secretary and knows the work, and he can do a great deal to help me, and I hope to be able to help him some. I trust the next meeting will be one of profit. Again I thank you.

The Chair asked if there was any further business to come before the Section, but there was none.

On motion of Mr. Mayo, the Section then stood adjourned.

Text of papers read by title :

## PHARMACEUTICAL NOTES.

The following notes, queries and comments were forwarded to the Section on Practical Pharmacy and Dispensing, and on motion, were referred to the chairman to be arranged for publication. It is regretted that the members did not more generally respond to the appeal of the committee and contribute their observations in the envelopes issued with the Proceedings of last year. The thanks of the Section are due to the following contributors for these notes : H. A. B. Dunning, Baltimore, Md., G. H. Lichthardt, Sacramento, Cal., Otto Raubenheimer, Brooklyn, N. Y., E. Q. Anewalt, Phillipsburg, N. J., L. L. Staehle, Newark, N. J., F. J. Llewellyn, Mexico, Mo., Dr. C. B. Lowe, Philadelphia, Pa., C. Osseward, Tacoma, Wash., and Wm. C. Kirchgessner, Grand Rapids, Mich.

### PRESCRIPTION DIFFICULTIES.

℞ Salol ..... 4
Thymol ..... 1
Ol. Anisi ..... 1
Misce et in caps. No. xx, dix.

In compounding this prescription the correspondent reports that the following manipulation was successful : triturate the salol and thymol until liquid, add oil of anise and 1 Cc. olive oil, and dispense in 5 minim soft capsules.

℞ Heroin ..... .09
Thiocol ..... 7.50
Syr. hematic hypophos. ..... q. s. ad. 150.00

The contributor of this prescription states that " thiocol, when dissolved

in the hematic syrup, causes a red-brown coloration." This coloration is no doubt due to the reaction between the iron salt contained in the syrup and the guaiacol of the thiocol (potassium-guaiacol-sulphonate).

℞ Thymol,
Menthol ..... āā gr. x.
Eucalyptol ..... gr. xx.
Cocaine mur. ..... gr. v.
Benzoinal ..... ʒ iv.
Misce.

As cocaine muriate is not soluble in benzoinal the compounder used the alkaloid cocaine and effected solution by warming.

℞ U. amara sulph. ..... gr. 36.
P. Bayer ..... gr. 72.
Misce fiat in caps., No. 24.

This prescription is accompanied by the following note: "Amara sulphate (bitter sulphate) is a local name for quinine. The 'U' before it makes it 'U' quinine or euquinine, which the physician had intended."

We cannot condemn too severely the carelessness exhibited in abbreviating the items in this prescription. Such methods are certainly not in keeping with twentieth century practices.

℞ Potassii iodidi,
Resinæ guaiaci ..... āā gr. lxxx.
Vin. colchici sem. ..... ʒ ss.
Aquæ cinnamomi ..... ʒ ii.
Syr. simpl. ..... q. s. fiat ʒ viiss.
Misce et sig. Tablespoonful three times a day.

This contributor comments: "The proper manipulation is to dissolve the iodide in the cinnamon water. Rub the guaiac with the syrup gradually added, and add to the aqueous solution little by little, shaking after each addition; finally gradually add the wine and agitate. If solution is added to the mixture of resin a separation will take place almost immediately, and if the wine is added before all the other ingredients are mixed, resinous precipitate takes place immediately. If made in accordance with the above directions a smooth mixture with the guaiac in suspension results."

℞ Adrelin Chloridi ..... ♏xv.
Nitroglycerin ..... gr. $\frac{1}{50}$.
Aq. ..... q. s. ad. ℥i.
Misi et ft. in mist.
d. t. dos., No. xxxii.
Sig. Dr. i. q. 4 hr.

This prescription was wanted in a hurry, and the pharmacist dispensed it thus:

Solution of adrenalin chloride (1 ÷ 1000) ..... ℥ i.
Spirit of glonoin, 1 per cent..... ♏lxiv.
Distilled water, sufficient to make..... ..... ℥ iv.

℞ Decoct. cort chin..... 300.00
Bromat. natr..... ..... 12.00
Aeth. spt. camp. ..... 5.0
Ext. nuc. vom..... 0.2
Misce.

Our correspondent writes: "The above Swedish prescription was brought in by a lady who said she had it put up in two stores, but it did not look, smell or taste the same as when put up in Sweden."

It was compounded with a decoction of calisaya, made by boiling calisaya 30 Gm. with 300 Cc. water ten minutes, and straining when cold. The second item is sodium bromide 12. For the third item he used

Spts. camphor..... 3.
Aeth. sulph..... 2.

The ext. nux vomica was dissolved in a little alcohol and water and added last. The lady said that the mixture was exactly as in Sweden.

If we had compounded this prescription we should certainly have followed the Pharmacopœia Svecica, and used the Decoctum Chinæ Acidum of that authority, containing 10 parts cinchona and 1.5 parts dilute hydrochloric acid in 100. In the same Pharmacopœia, Aether spirituosus camphratus is official, and is a solution of camphor 15 in spirit ether 85, the latter being ether 25, alcohol 75. Brometum natricum is the official title in that Pharmacopœia for sodium bromide.

℞ Tr. nuc. vom..... ℥ ii
Ingluvin ..... ℥ ii
Bov. gallæ..... ℥ i
Syr. aromatici..... ℥ i
Vini pepsini q. s. ad.. ..... ℥ iii
Misce. sig. dr. i. p. c. in aquâ.

This contributor dispensed for "French ox" (probably a first cousin to the Irish bull) purified ox bile, and for the syr. aromaticum the following:

Tr. aromat. Ph. G..... ℥ ii
Syrupus ad..... ℥ i

He gives no reason or authority for this formula for aromatic syrup, and we are inclined to dissent, as syrupus aromaticus is official in the British Pharmacopœia, and contains tincture of orange and cinnamon-water, and would not resemble a syrup extemporized from the German Pharmacopœial Tr. Aromat.

℞ Tinct. iodi.
Aquæ ammoniæ fort.
Collodii flexilis .....aa, ℥ ii.

The compounder writes: "It was a clotted and ugly mixture. I made a second lot, and set aside to see what it would do. The next day it was a clear solution of a sherry-wine color.

The clotting was due to the precipitation of the Canada turpentine and oil of the flexible collodion, and if the compounder had looked at the mixture a few days later he would probably have found an almost colorless liquid with a resinous precipitate.

℞ Antipyrinæ ..... ℥i.
Sodii borat ..... ℥iiss.
Acid carbolic ..... ℥i.
Chloral hydrat ..... ℥iss.
Glycerin ..... ℥i.
Aqua dest ..... q. s. ad. ℥viii.
Misce et Sig. Apply.

If improperly mixed, an oily liquid will separate and sink to the bottom of the bottle and cannot be distributed. The antipyrine should be dissolved in half the available water and the other ingredients in the remainder and these solutions mixed, when a homogeneous milky mixture will result. The difficulty here is due to one of the many incompatibles of antipyrine. In this case carbolic acid is presumed to be the disturbing ingredient.

℞ Extract opii ..... gr. v.
Iodoform ..... gr. xviv.
Ergotin ..... gr. xv.
Ext. hyoscyam ..... gr. xii.
Oleum theobrom ..... q. s. fiat suppos. No. vi.

Our correspondent states that he made the suppositories in a mould and that during a recent hot spell they crumbled, not melted or ran together. He had often made them before but had never had the same experience.

We presume that they were made by melting, and regret that the size of the suppository mould is not indicated. If made only 15 grain suppositories, then with nearly 8½ grains of medicaments in each we can imagine that it might be difficult to get perfect cohesion. However, we are inclined to believe that the crumbling was due to a change in the cacao butter. We have frequently noted that this product, if exposed in warm weather, undergoes a peculiar change, becoming white, dry and, if broken up or grated, loses its cohesiveness. The addition of a small amount of almond oil to the suppository mass generally corrects this.

℞ Iodine ..... gr. ii.
Potass. iodidi ..... gr. iv.
Acid carbolic ..... gr. ii.
Menthol ..... gr. iii.
Ol. gaultheriæ ..... ♏x.
Alboline ..... ad. ℥ii.
M. Sig. Use in atomizer 4 or 5 times a day.

The physician insisted on the potassium iodide being added, and as he wanted a clear solution it had to be filtered out. The compounder inquires, What is the use of the potassium iodide? I fail to understand it in this prescription.

The prescriber's intent evidently was to insure solution and absorption of the iodine.

℞ Sulphur precip. ..... ℥iv.
Camphor ..... gr. ii.
Tragacanth ..... gr. xx.
Liq. calcis, . . . . .
Aquæ rosæ ..... āā ℥ ii.

The contributor states that an excess of tragacanth is directed. In his experience three grains is sufficient if thoroughly mixed with the sulphur and camphor, and then sufficient of the water is added at first to more than cover the powders and rubbed rapidly to a smooth paste.

℞ Resorcin ..... ℈ iii.
Chloral hydrat ..... ℈ iv.
Acid sulphuros ..... ℥ iss.
Ol. ricini ..... gtt. v.
Spt. vini rectific ..... q. s. ℥ viii.

This mixture liberates chlorine and possibly with the formation of some sulphuric acid.

℞ Antimon. et potass. tart. ..... gr. i.
Codeinæ sulph. ..... gr. ii.
Syrup pruni virg. ..... ℥ ii.
Aquæ ..... q. s. ℥ iv.
Misce.

The tartar emetic causes a decided precipitation of the codeine.

℞ Lanolin ..... ℥ i.
Cocainæ mur. ..... gr. x.
Acid, oleic q. s.
Misce.

Evidently the intention of the prescriber was to have the cocaine dissolved in the oleic acid, but as the salt is insoluble the compounder substituted the alkaloid cocaine, thus correcting the physician's error.

℞ Nitro-glycerin ..... 0.2
Tinct. capsici ..... 2.5
Spt. vini rect.
Aquæ menth. pip. ..... āā 12.5
Misce.

In compounding this prescription our contributor allowed 20. Gm. 1

per cent. solution of nitroglycerin to evaporate spontaneously to 12.5 Cc. and used this in place of the alcohol directed.

℞ Lycopodii..... 3x. ℥ ss (2 gr. tablets).
Sulphur..... 3x. ℥ ss (2 gr. tablets).
Sig. Take two tablets alternately every three hours.

This is a homœpathic prescription, and means that one-half ounce of Lycopodium third decimal trituration be made into two-grain tablets, and that one-half ounce of sulphur third decimal trituration be similarly made into two-grain tablets.

To those not familiar with homeopathic pharmacy it may be interesting to explain that this trituration contains 1 part of the drug in 1000 of trituration. Up-to-date pharmacists will find it profitable to study, at least, to some extent, homeopathic pharmacy and a comparison of the pharmacopœias will bring out much information of interest.

INCOMPATIBLES.

*Holocaine Hydrochloride Solutions*, according to one correspondent, became very opalescent when poured into bottles. He attributes this to the alkalinity of the glass, and recommends that the bottle be rinsed with dilute hydrochloric acid.

We must consider this as a dangerous recommendation, as solution of holocaine hydrochlorate is most commonly used in ophthalmic practice.

*Diuretin* occasionally becomes insoluble, due to the absorption of $CO_2$ The manufacturers recommend that when this occurs the insoluble powder be mixed with hot water and just enough of solution of sodium hydrate to cause solution, which is permanent.

*Infusion of Digitalis*, made with cinnamon bark caused the precipitation of strychnine. The U. S. P. infusion does not cause such precipitation. The tannic acid of the cinnamon bark is the disturbing constituent.

*To Mix Tincture of Benzoin* with water it is a good plan to place the tincture in a mortar, and add the water in a constant stream while stirring.

*Boro-Salicylic Acid and Alkaloids.* An aqueous solution of salicylic acid does not precipitate any of the ordinary alkaloids, nor does an aqueous solution of boric acid (except after long standing, when in some cases, as cocaine, an insoluble borate is formed). The aqueous solution of a mixture of salicylic acid and boric acid precipitates all the ordinary alkaloids except codeine and morphine. The precipitates are presumably boro-salicylates, but the subject should receive careful study.

Oil is a good agent to "bind" ointment bases and water, though it is said "oil and water wont mix."

It is worthy of note that sodium salicylate will cause the solution of precipitates formed by the addition of water to alcoholic solutions of organic drugs. Instances, Tr. cinchonæ comp., and fld. ext. Cascara sagrada.

### ELIXIR TERPIN HYDRATE.

Mr. Otto Raubenheimer, of Brooklyn, N. Y., sends the following formula:

| | | |
|---|---|---|
| ℞ | Terpin hydrate | gr. cxxviii. dissolved in |
| | Deod. alcohol | ʒ vii and add |
| | Elixir tarax. co. N. F. | ʒ ivss. |
| | Glycerin | q. s. ad. ℈ i. |

Each fl. dr. = 1 gr. terpin hydrate.

He offers the following explanation: "I have prepared this elixir in winter, and it has been exposed to 40° F. without crystallizing.

"The elixir of terpin hydrate and heroine is made by adding heroine gr. $\frac{1}{24}$ to each fluid drachm."

*Comment.*—The introduction of compound elixir of taraxacum in this formula is objectionable, as it increases the danger of precipitation, and also the preparation would be so dissimilar to that generally supplied by manufacturers that it would be looked upon with suspicion. In many sections the National Formulary elixirs have been discriminated against because of the introduction of compound elixir of taraxacum into so many of these formulas.

Heroine hydrochloride being more soluble is preferable to the heroine.

Mr. William C. Kirchgessner recommends the following formula for basic elixir for making terpin hydrate preparations.

| | | |
|---|---|---|
| ℞ | Alcohol | 21 fl. ozs. |
| | Glycerin | 18 fl. ozs. |
| | Syrup | 3 fl. ozs. |
| | Water | 6 fl. ozs. |
| | Oil orange | 16 minims. |

This can be colored with caramel or cudbear to suit.

### PHARMACEUTICAL POTPOURRI.

By *normal salt solution* in medical practice is meant the physiological normal $\frac{6}{10}$ of 1 per cent. NaCl in water, not the volumetric solution.

"*This q.*"—"Sig. dr. i in aq 'q' three hours." "q" stands for quoque, meaning every.

*Salol in Ointments.*—It is recommended to dissolve the salol in warm almond oil.

*Licorice in Pill Masses.*—Pills of reduced iron and manganese dioxide are readily massed by the use of powdered licorice.

*Bolted Powders for Ointments.*—It is suggested to keep on the prescription counter vials holding sufficient supplies of such insoluble powders as zinc oxide, white precipitate, nut-gall, sulphur, mercuric oxide, etc., previously bolted, ready for use in compounding ointments.

*Oleum Naphæ* is a synonym for Oleum aurantii florum or Oleum Neroli.

*Litmus Test Solution* should be preserved by using a pledget of absorbent cotton to stopper the vials, and kept in the light. Solutions which have precipitated and changed in color may be reclaimed by boiling for some time.

*Pepsin in Powders* should always be dispensed with sufficient absorbent powder to prevent sticking. We find the so-called insoluble pepsin preferable for powders.

*Eye Drops*, consisting of one-half drachm or one drachm of solution, are recommended to be made up double the quantity to permit of filtration. We prefer to make up the exact quantity used, and filter through a very minute filter moistened with one drop of distilled water.

*Query.*—In answer to the query "What is generally given and how is it customary to dispense

℞ Sodii phosphas..... ℥i.

Mr. Otto Raubenheimer answers: One troy ounce of the U. S. P. Sodii phosphas. The recrystallized salt is the best, and as it is efflorescent even if kept in a carton or box, it should be dispensed in a wide-mouth bottle tightly corked.

*Soluble Hypodermic Tablets.*—A member inquires, how can we make a hypodermic tablet that will dissolve as quickly as claimed by the large manufacturers? Several suggestions have been offered, all worthy of experimentation: the addition of dried sodium sulphate, use of cane sugar, or of glucose in small amounts.

*Blaud's Pills.*—Where there is much demand for these made fresh, it is suggested that a stock preparation of the mass be made by rubbing up the powders, then adding glucose with the addition of some glycerin.

*Tincture of Iodine and Tincture of Camphor by Percolation.*—Mr. L. L. Staehle, of Newark, N. J., writes: "For many years I have made iodine tincture by putting the iodine into a glass percolator, the orifice of which was loosely packed with cotton, and pouring alcohol on same until the desired measurement is obtained. The same process I use in making spirit of camphor. Instead of breaking up the camphor into small pieces, I take the whole gum which avoids loss. This method is not only a saving of time but also serves as a filter."

*Time Saved by Sterilization.*—Mr. C. Osseward, of Tacoma, Washington, contributes the following note: "We had frequent occasion to compound for one of our physicians Ingall's adrenal solution according to the formula:

℞ Suprarenal gland in powder..... ℥i.
Acid boric..... gr. xvi.
Aqua cinnamon..... ℥iv.
Aqua camphor, hot..... ℥i.
Aqua dest., hot.....q. s. ad. ℥ii.
Macerate for four hours and filter.

This mixture spoils very readily, so that we had to prepare it fresh when called for. This delay proving very objectionable to the patients, I looked around for a method of dispensing with more dispatch. I thought of sterilization, and prepared a half-dozen one-ounce vials (the size usually prescribed). After filtration I sterilized these for fifteen minutes for three successive days. The results were entirely satisfactory, the solution being only slightly darker, and I have kept same for six months.

# MINUTES

OF THE

# SECTION ON EDUCATION AND LEGISLATION.

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FIRST SESSION—FRIDAY MORNING, AUGUST 7, 1903.

The Section was called to order by the Chairman, J. W. T. Knox, at 10:30 a. m., and Mr. Knox asked Mr. J. M. Good to take the chair while he read his address, which he delivered as follows:

## CHAIRMAN'S ADDRESS.

The young man of the present day who does not get a pharmaceutical education probably does not want one, for eighty schools of pharmacy in the United States and Canada provide opportunities in great abundance. However, lest we become too much inflated with pride over our educational system, we may well reflect that mere figures may be more inspiring than that for which they stand. Colleges of pharmacy in this country—I use the terms college and school synonymously—have increased in number about thirty-five per cent during the past three years, and there is little reason to hope that the worst is over. At one time in our history such an increase would have been hailed as an evidence of pharmaceutical progress. But it is possible to have too much of even so good a thing as colleges of pharmacy, and it is altogether likely that we were already suffering from such an embarrassment of riches. This is wholly without disparagement of the newcomers; yet it helps us to understand the feelings of the impecunious man who said he valued his twelve children at a million dollars apiece but wouldn't give fifty cents for another.

To state bluntly a generally conceded fact, what we need is fewer pharmacy schools and better ones—and fewer schools would mean better ones because of concentration of students, income and teaching ability. Combination has so long been the popular order that one may almost wonder how our pharmaceutical teaching institutions have remained unaffected by it. Even the medical colleges have begun to learn the lesson of commerce, and it would not be difficult to cite instances where one excellently equipped and largely attended school has succeeded several smaller warring ones. If there be a Morgan among us willing to do the cause of pharmaceutical education a service of no mean proportions, let him come forth and eliminate unnecessary pharmacy schools and their wasteful competition by merging them with the dozen schools that are really needed and could be reasonably well supported. No feverishly fertile imagination is required to realize that concentrating in a dozen such schools the students now scattered thinly among eighty, would yield better results than are at present obtained.

Dr. Frank Billings pointed out in his recent presidential address to the A. M. A. that

of the 5,000 new graduates in medicine each year, 3,000 are not needed; that is to say, 2,000 new disciples of Aesculapius each year would be sufficient to supply the small demand of an increasing population, and fill vacancies caused by retirements, death, etc. Pharmacy, however, suffers not so much from the number of its students as from their deficiency in preliminary education, and this is more or less directly traceable to the surplus of colleges with which we are afflicted. The attempt is being made, and I believe in all good faith, to adopt a uniform entrance requirement so that he who presents himself for admission to a pharmacy school must show a high-school diploma or its full equivalent before he can become a student. With a small number of well attended schools there would be no great obstacle in the way; but where the number is large and the competition for students is brisk—for the hideous specter of a deficit is ever before the majority of colleges—it is not hard to understand the difficulties that have thus far beset those wishing to bring about such an agreement.

Is is usually a much simpler matter to recognize a bad state of affairs than to remedy it, and while elimination of the many unnecessary, and the several conspicuously unfit, colleges of pharmacy would doubtless be a good thing all around, it is a problem of such grave difficulty that there seems no way of solving it. But even under present conditions fair progress is being made, and in all probability the adoption of the high-school education requirement for entrance is not far away. With that in force, the personnel of the student body will be improved, and a degree in pharmacy will have a more definite value, so that the proposed diploma requirement for admission to board examinations will mean something.

Let us not despair. Fifteen years ago medical education was in a less creditable condition than pharmaceutical education is to-day; for while there were numerous medical schools having high standards both for entrance and for graduation, the majority gave two-year courses, comprising less than one year's actual college work, and practically without any educational entrance requirement. To-day several of the great schools of medicine require their students to enter with an A. B. degree or its full equivalent, while in several States I understand that a medical diploma is not legally recognized unless from a college which requires at least a high-school education of its matriculates. If you say it is but a dream to think that such things are in store for us, I will remind you that higher and better medical education was considered a dream by the sternly practical men of fifteen years ago. We never surpass our ideals, so let us see to it that our ideals are sufficiently high.

The question of reciprocal registration is attracting more and more attention as the injustice and hardship of the present system becomes increasingly apparent. Our country has long ceased to be, if it ever was, a mere aggregation of States. In unity of sentiment, in ideals, in all the aspects of national life, it is a Nation. And yet we pharmacists tag along with a motley assortment of pharmacy laws—warranted no two alike—and are immensely amused at the spectacle of various State boards making faces at each other and declaring that, on account of difference of standards, reciprocity is not to be thought of. Practically every State legally ignores the very existence of able and competent pharmacists outside of its own boundaries. Is it not possible for some one to reach a solution of the problem, so that a man who has once proved his fitness beyond question may practice pharmacy anywhere in the United States, without submitting to the annoyance and expense of a new examination every time he crosses an imaginary line which separates one State from another? We cannot expect to have a national pharmacy law, since the regulation of pharmacy is a function of the State, but there seems no reason why we should not reach the same end by a purely voluntary arrangement.

The charge of adulteration and substitution brought by the New York Board of Health against the pharmacists of that city, and the subsequent introduction of the anti-

substitution bills in the New York legislature, are among the most important events of the past year. The Board of Health claimed that of 373 samples of a certain drug purchased by it but 58 were pure, whereupon one of the more conservative and influential daily papers took up the case and prosecuted it vigorously in the court of public opinion, with great damage to the defendants' cause. I have no means of knowing how far the charges were justified, but it is doubtful if the indignant denials and counter-charges of the pharmacists went far to reinstate them in public confidence, however sincerely made, and one could wish that their case had been more skillfully conducted. Shortly afterwards the passage of the Bostwick-Dowling bill by both branches of the legislature showed that something more powerful was behind the bill than the proprietary interests that worked openly for its enactment into law. The best efforts of the retail drug trade were required to prevent the Governor from signing it, and had not its phraseology been such as even to forbid the druggist's rectifying a prescriber's flagrant error, it is extremely doubtful if the veto would have been forthcoming. I have felt that it would have been good strategy for the pharmacists to direct their energies towards a sensible amendment of this portion of the bill, and then consent to its passage on the ground that it could injure no one save such as deserved punishment.

It is significant that the medical journals of New York were almost unanimous in their support of the bill, and if their attitude did not meet the approval of their constituency it is surprising that vigorous protests were not forthcoming. Probably we are safe in assuming that the bill had the silent approval of the medical profession, besides that of a considerable portion of the public; in any event it may come up in modified form at the next session of the legislature, even though the claim is made that laws now on the statute books are sufficient. More than this, I look for a considerable crop of similar bills within the next few years, and we may well consider what attitude should be assumed towards them.

It seems to me that the lesson is so plainly written that no one need fail to read it aright. The pharmacist is declared a competent person by the law of the State, and he must accept full responsibility for the identity and purity of the products dispensed by him. No attempt to shift the blame in case adulteration is charged against him will avail anything with the public: nothing but proof of a clean record will satisfy. He is supposed to know exactly what he is doing and the "didn't know it was loaded" plea, shakes public confidence almost as much as a downright confession of guilt. He enjoys a confidential relation with the medical profession, and with the public, and he must be above suspicion in all respects. And just as the physician or lawyer who palliates breaches of professional trust on the part of his colleagues brings more or less suspicion upon himself, so the pharmacist who treats the secret substitution problem lightly risks being unjustly suspected.

The time has come for the honest, conscientious pharmacists of America, who constitute an overwhelming majority over the others, to take advanced ground upon this important question by publicly repudiating the secret substitutor and his devious ways. The taunt used most effectively by the New York papers in the late unpleasantness was that the honest druggists did not unite in condemning the actions of those who had deliberately brought reproach upon the drug trade, and there was thus no way of determining who were worthy of trust. This, unfortunately, has been the general attitude of druggists all over the country, and it is one very likely to be misinterpreted elsewhere, just as it has been in New York. Calm in the belief that secret substitutors are a class numerically weak, they have been looked upon with more or less complacency, regardless of the fact that they exert a mighty and baleful influence in alienating from the whole drug trade that share of public confidence to which it is fairly entitled.

If the pharmacists of this country who value their good names highly, wish to show to the physicians and the public that they deprecate and abhor the mercenary spirit of that

small class whose actions bring disgrace upon their own calling, let them unite to stamp out the evil of secret substitution. They can do this by assisting to make laws where existing laws are inadequate; and by setting the seal of disapproval upon such men through action of their associations, after conclusive proof of the offense has been furnished.

Even so selfish a motive as self-preservation dictates the necessity of some such step. It may not be generally known that within the past year a movement was inaugurated to raise a fund of $200,000 from proprietary manufacturers to be used in defraying the expense of passing laws against secret substitution all over this country where specific legislation upon the subject does not exist. A considerable part of this money was to be used in "creating public sentiment" favorable to it, which means that had the plans been successful—as I believe they were not—the storm of newspaper abuse and slander of the drug trade which would have followed would have been without parallel in our history. We do not need anything more of that sort, and should strive to anticipate it if possible by some such action as I have indicated. For while it was not successful, the movement developed considerable strength, which fact causes me to fear that it has not been altogether abandoned.

If there is to be any legislation of this sort, the drug trade had better have a hand in it than leave it wholly to their enemies. It is evident that a bill emanating from the best element of the drug trade would be more equitable and effective, and freer from objectionable features than one instigated by the united proprietary interests; furthermore, there is an opportunity for the drug trade to obtain a distinct tactical advantage by taking the initiative, and in doing so they would provide a crushing reply to the slurs of such newspaper critics as those who declared in New York that opposition to the Bostwick-Dowling bill was confession of guilt. There should be no special difficulty about drafting a bill distinguishing between that fraudulent substitution dictated by mercenary motives, and that beneficent substitution by which the druggist interprets the spirit instead of the letter of the prescription for the purpose of rectifying the prescriber's error. It seems to me that every conscientious pharmacist could afford to support such a movement, and I believe united action along this line would go far to win the high esteem of both the medical and lay public. The crusade against the indiscriminate sale of morphine, cocaine, and other enslaving drugs is one of the best things ever undertaken by pharmaceutical associations, and a similar crusade against secret, fraudulent prescription substitution would be equally creditable.

I hope no one will misunderstand me in this. I do not believe the evil is one-tenth so prevalent as some have charged. I do not think the results in New York are anything like conclusive evidence, for when critically examined, the report of the Board of Health is seen to be full of inconsistencies. Nevertheless, we know, and we may as well admit, that some secret substitution is practiced, and that it is not restricted to any single portion of the country. Wherever there is, be it ever so little, it is too much, and must be abolished. No one is in better position to kill it than pharmacists: no one is more vitally interested in doing so!

The address of the Chairman was greeted with applause, and, on motion of Mr. W. H. Burke, was received and referred to the Publication Committee.

Mr. Knox resumed the chair.

MR. BURKE: Mr. Chairman, I would like to say a few words in regard to the address, particularly that part which advises the retail pharmacist, or each State association, to have enacted legislation which will control substitution. It has given me an idea. In Michigan we are looking for a new pharmacy law, with strict requirements of those ap-

pearing before the board. Now it seems to me if we put this clause against substitution in the bill, it will appeal more strongly to the people of the State, and in that way help us to improve the status of pharmacy in the State.

Secretary Mason was then called upon by the Chair to present his report, which he made in abstract, the full text being as follows:

## REPORT OF THE SECRETARY.

The year's legislation in detail, considered in the alphabetical order of the various states and territories, is as follows:

The legislative year of 1902–3 in pharmacy has been full of interest, and full of suggestion also. It has registered a distinct advance in the enactment of a number of laws of real importance and necessity, and as usual it has brought forth also a chaotic mass of impossible, vicious and foolish measures which would have been sad commentaries on our national intelligence had they not failed of passage. No fewer than ninety-eight bills were introduced in the various State and territorial legislatures; nineteen of these found a place upon the statute books; and it is extremely fortunate that on the whole this winnowing process selected the wheat from the chaff with sure intelligence.

Speaking first of the bills which became law, it is exceedingly gratifying, in view of the threatening spread of the cocaine evil, that the year has produced four cocaine acts—those of Georgia, Illinois, Pennsylvania and Texas. Three of these measures contain features which render them decided improvements over pre-existing cocaine legislation. The Georgia law is the customary one limiting the sale of cocaine to physicians' prescriptions, and prohibiting the refilling of these prescriptions. But all three of the other laws go further and stop up a leak which has practically nullified the cocaine acts of several of the Southern States: they prohibit physicians from giving prescriptions for the drug to habitués, provide quite heavy penalties for violations, and in one instance (the Illinois measure) declare that the offending person shall have his licence as a physician revoked upon conviction of the second offense. Moreover, recognizing that catarrh snuffs and other preparations containing the drug are fertile causes of cocaine addiction, the Illinois act by implication, and the Pennsylvania act by specific statement, place the sale of these articles upon exactly the same basis as the alkaloid itself. The Texas measure unfortunately exempts proprietary preparations, and it differs from the other acts also in throwing its restrictions around the sale, not of cocaine alone, but as well of morphine and opium. Incidentally it may be remarked that the phraseology of the Texas enactment is unfortunately such that the druggists of the State fear they will not be permitted to sell such common preparations as paregoric and Dover's powder save upon a physician's prescription, and in conformity with the provisions of the law.

Not less important than the cocaine measures are the new pharmacy laws enacted in the territories of Arizona and Hawaii. Wholly apart from its intrinsic merit, the Arizona law is of great importance and significance because it all but completes the scheme of State and territorial legislation in pharmacy which was begun thirty years ago. Every State in the Union proper now has a pharmacy law, and every territory with a single exception. Indian Territory alone has no law, although efforts to secure one were made this year as they had been made during previous years. With respect to the new Arizona measure, it may be described as differing little from the customary pharmacy law, and as being rather better, indeed, than would naturally be expected in a sparsely settled territory in the west. But it is to the Hawaiian act that we must look for the greatest degree of satisfaction. Hawaii has taken the initiative in adopting the Beal Model Law, and as a result even the original thirteen States, with all their traditions and their civilization, are compelled to yield the palm to a far-off island that only yesterday became even a territory. The Hawaiian act, while in some respects departing from the

Model Law, contains most of the restrictions to practice imposed by Professor Beal's admirable measure, even to the graduation requirement, and is on the whole superior to the law of any State or territory in the Union.

The year has brought a number of liquor enactments of unusual importance. New York, indeed, was the theatre of quite dramatic interest during the weeks in which the liquor question was being discussed in the legislative halls of her capital city. Efforts were made by the Excise Commissioner to have a law enacted which would have proved inimical to the interests of pharmacists, but representatives of the drug trade jumped to the defense with determination and intelligence, upheld their cause before legislative committees with rare vigor and success during several weeks, and finally secured the passage of a measure of their own parentage with which they are now expressing the liveliest satisfaction. This unique act provides that druggists who desire to trade in liquor other than on physicians' prescriptions may sell not more than a pint at a time, and not to any one person oftener than once in twenty-four hours, upon the use in every instance of a special ten-cent stamp. The measure has been criticised in some quarters, but it would seem to have the advantage of nicely adapting the revenue expense of any druggist to the amount of business done by him, while it would remove from him that temptation to do a larger liquor business which is always present when the tax is so considerable as to constitute a financial burden.

New liquor laws are likewise to be reported from North Dakota, Vermont and New Hampshire. The North Dakota measure emanated from other than pharmaceutical circles, and provides that henceforth no liquor permit shall be issued to a druggist unless he secures a petition signed by 80 per cent. of the freeholders and 70 per cent. of the women in the town, ward or village in which he does business. Previously it was necessary to secure the signatures only of 25 freeholders and 25 women. Moreover, not more than half a pint of liquor may be sold to the same person within twenty-four hours; and it is provided that the customer must be known to the druggist, and must in every instance sign an affidavit. A second North Dakota law passed this year authorizes counties to pay rewards of $50.00 for information leading to the arrest of persons violating the liquor statutes!

With respect to the new liquor measures of Vermont and New Hampshire, it may be explained that both these commonwealths have now become other than prohibition States for the first time in nearly fifty years, and that general liquor laws have accordingly been enacted. In Vermont a druggist may now sell liquor "only upon a physician's prescription," and the prescription itself must specifically state the ailment for which the liquor is given, and must not be refilled. This restriction is not imposed by the New Hampshire act, but it is provided in that measure that all liquor sales shall be registered. In neither State may a druggist secure a license unless he is a registered pharmacist and in business "on his own account"—a provision intended to prevent saloon keepers and others from doing a liquor business under the guise of druggists. In New Hampshire the annual tax is $10.00. In Vermont it is "not *less* than $10.00," and presumably as much more as the local authorities may happen to find themselves in urgent need of.

Other more or less important laws of the year may be briefly considered. The druggists of California are quite pleased over the enactment of a measure in their State which imposes an annual tax of $200.00 upon all itinerant venders of drugs—"Kings of pain," "Quaker herb doctors," and others of this numerous and versatile class. In Nebraska a law was secured providing that henceforth pharmaceutical graduates shall not be exempted from examination by the Board of Pharmacy; New York State added one to the several laws throughout the country which prohibit the promiscuous distribution of medicine samples around on door steps and in yards; in Utah a measure was passed that restores to pharmacists a class of business which the general storekeeper had attempted to usurp; in Arkansas the druggists secured amendments to the pharmacy law which

provide for re-registration, and which also strengthen the enforcement features of the act; in Maine an amendment was gained placing the nomination of candidates for the Board of Pharmacy in the hands of the State Association; and in North Dakota the pharmacy law was so modified that persons who desire to become apprentices shall register as such, shall possess educational qualifications sufficient to gain entrance into a high school, and shall not be permitted to enter the examination for assistant pharmacists except after two years of service as registered apprentices.

Almost without exception, if not entirely so indeed, the foregoing list of the year's legislation spells progress. Perhaps the only act which proves the general rule by an exception is one which unfortunately gained a place upon the statute-book of Virginia. This permits regularly licensed physicians in towns and rural districts of less than 1,500 inhabitants to register as pharmacists without examination. The druggists of Virginia deserve much sympathy. They are subject to assaults of a similar nature at nearly every session of the State legislature. In 1900 eight bills were made law which required the Board of Pharmacy to register specified individuals without compelling them to go through the needless and annoying formality of an examination. In 1901 an act was passed permitting all persons who had had three years of "experience" before the pharmacy law was first enacted in 1889 to become registered for the mere asking within a specified time. In 1902 an additional number of bills passed the legislature privileging certain persons to register without examination, but this time the Governor had the courage and the wisdom to say "Nay." And now, in 1903, when the civilization of the world, and presumably of Virginia, has reached a dizzy height, we are treated to the spectacle of physicians being converted magically into pharmacists by fiat of law—an achievement which would have delighted the heart of any mysterious alchemist of the dark ages!

Turning now more briefly to the numerous measures which failed of success, it is worth while pausing at first to remark, what has already been intimated, that for the most part the bills which met their death were the very ones which richly deserved such a fate. Nearly all of them were either unjust, impossible, visionary, or all these things together. There were a few exceptions, however, and these may receive a moment's consideration.

The pharmacy laws of Idaho and Texas are defective in providing, not for a single State Board of Pharmacy, but for county or district boards; and vain attempts in both States were made again this year, as they had been made before, to improve the situation. The Texas bill passed the legislature only to receive the Governor's veto. The pharmacists of Indian Territory, as has already been stated, failed again in their endeavor to secure the enactment of a pharmacy law and redeem their Commonwealth from the disgrace of being the only one now in the country without an act restricting the practice of pharmacy to competent persons; in Florida the druggists were unsuccessful in attempting to gain the passage of amendments strengthening the pharmacy act; in the prohibition state of Maine they failed in an effort to procure a law legalizing the sale of liquor in drug stores; in Alabama they likewise failed to secure an amendment preventing physicians from registering as pharmacists without examination; in California an attemp was unsuccessful to abolish re-registration and make the State support the Board of Pharmacy by annual appropriation; and in Pennsylvania a bill making graduation a requirement to practice fell by the wayside. Cocaine measures of varying merit failed of passage in the legislatures of Alabama, California, Minnesota, Nebraska, Missouri, Wyoming and West Virginia. "Shorter hours" bills, introduced in behalf of the clerks, met the same fate in California, Wisconsin, Minnesota and Washington, D. C.

Leaving these more or less commendable measures, most of which were introduced through the efforts of the pharmacists themselves, it may be observed that the year has been fertile in two types of bills which, like the poor, are always and eternally with us—

one providing that proprietary medicines shall bear their working formulas upon the label, the other permitting physicians to register as pharmacists without examination. Measures of the first type were introduced in six legislatures,* and in addition to these there were bills in different States prohibiting † the sale of "patents" which contain more than one per cent. of alcohol, directing ‡ that "patents" which contain any alcohol whatsoever shall state the percentage on the label, declaring § that "patents" which contain more than five per cent. of alcohol shall be deemed alcoholic beverages and sold only by dealers who pay a retail liquor dealer's license, and prohibiting ‖ the manufacturers of "patents" from using portraits of persons in advertisements without their consent. Measures of the second type, permitting the registration of physicians, were considered by six legislatures,¶ and other efforts to let down the bars were made also in five bills in as many States which gave the privilege of registration without examination to graduates of pharmacy,** to all pharmacists who had had five years' "experience" prior to the passage of the original pharmacy act †† (1882), to eighteen specified individuals,‡‡ to all clerks of seven years' experience,§§ and to "every person who had been engaged in the business of dispensing pharmacy on his own account for five years." ‖‖ The climax was reached in a Connecticut measure which generously and philanthropically suggested that the pharmacy act be suspended entirely for two years! The Virginia bill, already mentioned, was the only one of this numerous class which became law, and we should be devoutly thankful that no others ran the gamut successfully.

Numerous other measures inimical to the interests of pharmacists were introduced in various legislatures. Great concern was aroused in New York State over the Bostwick-Dowling measure, which would have rendered the druggist amenable to criminal prosecution if he dispensed in a prescription the preparation of one manufacturer when the preparation of another was indicated, and which was defeated only after the most determined and able opposition of the leading pharmacists of the State. Equal interest was felt in a Wisconsin measure which, introduced at the behest of a cutter, would have prohibited the operation of the tripartite plan in that State, and the death of which was accomplished only through the earnest efforts of representatives of the N. A. R. D. and the local associations.

A Massachusetts bill provided for the abolition of the Board of Pharmacy, while two other measures, one in Massachusetts and one in Missouri, made provision for the consolidation of the Boards of Pharmacy, Dentistry and Medicine. It was in Massachusetts also that effort was made, as it had frequently been made before, to take away from the Board of Pharmacy the salutary authority which it has over the issuance of liquor licences to the pharmacists of the State. Poison-cork or poison-bottle bills, contrary to the usual condition of things, appeared in but three legislatures ¶¶ this year. In four States *** bills were introduced through the efforts of the saloon interests which in some instances

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* Massachusetts, Minnesota, Tennessee, Washington, Oregon and Pennsylvania.

† Massachusetts.

‡ Minnesota.

§ Minnesota.

‖ New York.

¶ Arkansas, Michigan, Minnesota, Kansas, Wisconsin and Massachusetts.

** Wisconsin.

†† Wisconsin.

‡‡ Kansas.

§§ Nebraska.

‖‖ Nebraska.

¶¶ New York, Minnesota and Tennessee.

*** Michigan, Minnesota, Connecticut and Missouri.

would have compelled pharmacists to pay a tax nearly, if not quite, equal to that of saloon-keepers, and which would have placed the druggist almost upon the saloon-keeper's level. A New York measure would have given general dealers the right to deal in pretty much everything, if only in packages bearing the label of a registered pharmacist. And in Massachusetts and New York bills were brought forward which, like those that failed in a number of States a year ago, would have rendered it illegal for the pharmacist to carbonate his own soda water on the premises.

A bird's-eye glance backward over the legislative year can scarcely fail to arouse feelings of gratification. Two pharmacy laws have been enacted in territories which previously had no measures at all; one of these, that placed upon the statute book of Hawaii, is an adaptation of the Beal Model Law and is perhaps superior to the pharmacy act of any state or territory; four cocaine bills, three of them uncommonly meritorious, have been passed; the druggists of New York State have secured the enactment of a liquor law with which they are greatly pleased; in the prohibition States of Vermont and New Hampshire the illegal and promiscuous sale of liquor has given way to its sale under restrictions which are at once wise and enforceable: provision has been made in North Dakota for the registration of apprentices and the establishment of a grammar school requirement; in California the unfair and unskilled competition of hawkers and venders of medicines has been lessened; in Utah that of grocers and general dealers has been largely eliminated; and in other states the pharmacy acts have been strengthened and improved in various ways. It is true that a number of additional measures of a meritorious nature failed of success in different states, but on the other hand death was meted out successfully to a host of bills which, if made law, would have done pharmacy incalculable harm. The year has altogether been a year of progress; the wheel has been turned forwards, not backwards; and this assurance should give us hope for the future.

### A. BILLS WHICH BECAME LAW.

*Arizona:* A pharmacy law was enacted in this Territory for the first time. By its terms graduates from "legally constituted colleges of pharmacy" are permitted to register without examination, as are also (until June 10) pharmacists who were in business at the time the measure was passed. All other persons must be examined; and candidates for registration as full "pharmacists" must have had four years of experience, while two years is demanded of "assistant pharmacists." A rather novel feature provides that all physicians' prescriptions dispensed in the store shall be filed and preserved for two years. A copy shall be furnished upon the request of the attending physician. Poisons in the "A" and "B" schedules shall be labelled "Poison," and those in the "A" schedule registered in the usual manner. The "A" schedule comprises "arsenic, corrosive sublimate, cyanide of potassium, hydrocyanic acid, strychnine, cocaine, and all other poisonous vegetable alkaloids and their salts; opium and all its preparations, except those which contain less than two grains to the ounce." General dealers may sell "proprietary medicines or original package of drugs and medicines, but in no case shall they compound or prepare any pharmaceutical preparations or prescriptions."

*Arkansas:* Amendments to the pharmacy law were secured by the pharmacists of the State which provide for biennial re-registration at an expense of $1.00, and which strengthen the enforcement features of the act.

*California:* The State Board of Pharmacy succeeded in securing the passage of a measure imposing an annual license tax of $200 upon all itinerant venders of "drugs, nostrums, ointments and appliances sold for the cure of diseases, injuries and deformities." This tax is in addition to such licenses as may be imposed by cities and counties.

*Georgia:* A law was enacted restricting the sale of cocaine to physicians' prescriptions, limiting the refilling of these prescriptions to the orders of the physician in each case, and rendering violators of the act guilty of a misdemeanor.

*Hawaii:* An excellent measure has become law in this Territory, which is an adaptation of the Beal Model Pharmacy Law of the A. Ph. A. It contains all the restrictions to practice provided for in that bill, even to the graduation prerequisite, and is perhaps superior to any act in force among the States of the Union themselves. For a copy of this measure the Association is indebted to Mr. S. L. Rumsey, a life member, residing in Honolulu.

*Illinois:* A cocaine bill was passed in this State limiting the sale of the drug to the prescriptions of regularly licensed physicians and dentists, these prescriptions to contain the name and address of the patient; prohibiting the refilling of such prescriptions; forbidding physicians or dentists to prescribe cocaine "to any person addicted to its habitual use," and providing a penalty for the first offense ranging from $50 to $200, and for the second offense from $200 to $1000. Moreover, if upon the second offense the "person offending shall have a license as a physician, dentist or pharmacist, such license shall be revoked." And the act involves the sale, not only of cocaine itself, but of "any preparation containing cocaine or any salts or any compound thereof."

*Maine:* Amendments to the pharmacy laws were passed which place in the hands of the State Pharmaceutical Association the power to make nominations for the Board of Pharmacy, and which change the compensation of the members of the board to a *per diem* basis in lieu of the former method of payment by fees.

*New Hampshire:* For the first time in fifty years New Hampshire has become other than a prohibition State. A general liquor license act has accordingly been made a law, and this provides that druggists may sell liquors "for medicinal, mechanical, chemical and sacramental purposes only," upon payment of an annual tax of $10.00, the sales to be registered in each instance. A license under this provision may even be given a druggist in a non-license town in case the three license commissioners grant the privilege. Druggists who desire to conduct a general business in liquor are permitted in license towns to take out a regular $800 license. One feature of the law provides that no pharmacist shall be given a liquor license unless he be registered as a pharmacist, and unless he own at least one-half of his business. This is to prevent saloon-keepers and others from doing a liquor business under the guise of druggists.

*New York:* Early in the session of the New York legislature one or two liquor measures were presented which would have proved seriously inimical to the interests of the druggists of the State. After vigorous work on the part of representatives of the various pharmaceutical associations throughout the State, two bills finally became law, which are proving very satisfactory:

1. The Raines' liquor law was so amended that pharmacists who sell liquors on prescription only will hereafter pay an annual tax of $7.50 instead of $5.00. As first introduced into the legislature, the amending measure provided for a much larger increase of this tax.

2. A unique law was enacted for the benefit of those druggists who have occasion to sell liquors for medicinal purposes without a prescription, and yet do not care for, or cannot afford to take out a regular store-keeper's license. It permits them to sell not more than a pint of liquor, and not to any one person oftener than once in twenty-four hours, upon the use in every instance of a special ten-cent stamp, each sale to be recorded in a book kept for that purpose.

3. In addition to the two foregoing liquor measures, a third bill of another sort became law in New York state. This was one which makes it a misdemeanor to throw around on doorsteps and in yards, and within reach of children generally, samples of drugs and medicines.

*North Dakota:* 1. The Shiels' liquor law. This new law amends the pre-existing liquor act, and provides that hereafter no liquor permit shall be issued to a druggist unless he obtains a petition signed by 80 per cent. of the freeholders and 70 per cent. of

the women in the town, village or ward of the city in which he does business. Previously it was necessary to secure the signatures only of 25 freeholders and 25 women. Other provisions of the measure impose restrictions upon the sale of liquor: the applicant for liquor must be personally known to the druggist before the sale can be made; an affidavit has to be signed by each customer, and this must include the residence and street number of the applicant; not more than a half-pint of liquor can be sold to any one person within twenty-four hours.

2. In addition to the foregoing drug-permit law, the legislature passed another liquor bill authorizing counties to pay a reward of $50.00 for information leading to the arrest of persons violating the liquor statutes.

3. An apprenticeship law. Apprentices must file with the Secretary of the State Board of Pharmacy a certificate stating that they have entered into an apprenticeship, and giving evidence of educational qualifications sufficient to pass an entrance examination to the high schools of the state. Persons may not come up for examination as "assistant pharmacists" who have not been registered as "apprentices" for two years.

*Pennsylvania:* A cocaine act was passed providing that the drug shall not be sold except upon the prescription of a registered physician, druggist or veterinary, and that no such prescription shall be refilled. Prescribers are forbidden from writing prescriptions for any person known to them to be "habitual users of cocaine." Violation of the law will be followed by a "fine not exceeding $100, or imprisonment of not more than six months, or both, at the discretion of the court." Proprietary preparations which contain cocaine are specifically affected by the act.

*Texas:* An act restricting the sale of "morphine, opium, cocaine, chloral, *or any of the derivatives thereof*," except upon the written prescription of a practicing physician, this prescription not to be refilled. The prescriptions are directed to be kept in a book "subject to the inspection of the public." Physicians are prohibited from prescribing the drugs for "any person known to be an habitual user of the same, except in cases of actual sickness." Proprietary medicines are specifically exempted from the application of the act. Violators of the law "shall be fined in the sum of not less than $25.00 nor more than $250.00, and in addition thereto may be imprisoned in the county jail not exceeding six months." Inasmuch as the act prohibits the sale, except on prescription, "of any of the derivatives" of the substances mentioned, the druggists of Texas seem to fear that it will not now be possible for them to sell any preparation containing cocaine, opium or morphine, such as paregoric and Dover's powder, except on physician's prescriptions and in conformity with the provisions of the law.

*Utah:* The Barrett pharmacy act restoring to pharmacists a class of business which the general storekeeper has attempted to usurp.

*Vermont:* Like New Hampshire, Vermont has become during the past year other than a prohibition State. A general liquor law has accordingly been enacted, and under the provisions of this druggists are permitted to sell liquors "only for medicinal purposes and upon a physician's prescription," after payment of an annual tax of "not less than $10." A bond for $1000 must be furnished in each case, and this is forfeited upon conviction of the third offense. The prescription must specifically state the ailment for which the liquor is given, and it must not be refilled. Licenses are issued only to those pharmacists who are registered, and who are in business on their own account.

*Virginia:* A law was enacted permitting registration without examination to physicians residing in towns and rural districts containing 1500 or fewer inhabitants.

### B. BILLS WHICH FAILED TO BECOME LAW.

*Alabama:* 1. A bill restricting the sale of cocaine to physicians' prescriptions.

2. A bill amending the pharmacy law in order to prevent physicians from securing registration as pharmacists without examination.

*Arkansas:* 1. A measure permitting physicians to register as pharmacists without examination.

2. A broad measure providing that, except on prescription, no medical compound containing "any morphine, or opiates of any description, narcotics, or poisons of whatsoever kind in any measurable quantity," shall be offered for sale unless there be printed on the wrapper, in heavy type, the words: "This package contains poison."

*California:* 1. A measure revoking the re-registration clause of the pharmacy act; and a supplementary

2. Bill providing for the support of the Board of Pharmacy by the State, appropriating $6,000 annually for the purpose.

3. A bill prohibiting the sale of morphine, cocaine or opium, save on physicians' prescriptions, these prescriptions not to be refilled; and providing that physicians who should "knowingly" prescribe the drugs for friends would render themselves subject to a fine ranging from $25 to $250.

4. A measure limiting the average work-day of drug clerks to ten hours.

*Colorado:* A bill striking out from the pharmacy law of the State the following exemption: "Provided, that nothing in this act shall in any manner interfere with the business of merchants in towns having less than 500 inhabitants, in which there is no licensed pharmacist, to sell such medicines, compounds and chemicals as are required by the general public, and in form and manner prescribed by the Board of Pharmacy."

*Connecticut:* Several bills inimical to the interests of pharmacists were introduced in this State, but all were "killed" through the good work of the Committee on Legislation of the State Association.

1. Suspending the pharmacy act for two years, during which time pharmacists or clerks with five years' experience could secure registration without examination.

2. Increasing greatly the number of poisons to be registered on sale.

3. Providing that a druggist might be convicted of the illegal sale of liquor by reputation and hearsay alone—a beautiful arrangement which now obtains with respect to the saloon-keepers.

*Delaware:* A measure was introduced which would have increased the stringency of the pharmacy law. It was defeated by the pharmacists themselves on the ground that the present law was satisfactory.

*Florida:* A bill providing for annual re-registration and strengthening the enforcement features of the pharmacy act.

*Georgia:* A bill was introduced which would have compelled graduates of pharmacy and medicine not only to pass the State Board examination in pharmacy, but to show evidence of having had three years' "experience," which would also have made it necessary for the Board of Pharmacy to hold not less than two meetings annually, and which would have prohibited any one connected with a college of pharmacy from being a member of the Board.

*Idaho:* A bill, fathered by the pharmacists themselves, to remodel and make more effective the regular pharmacy act.

*Indian Territory:* Effort was vainly made again during the past year to secure a pharmacy law in this Territory—the only Territory or State now without one.

*Kansas:* 1. Sixteen measures were introduced providing for the registration without examination of specified individuals.

2. Still another measure would have converted all registered and practicing physicians into registered pharmacists without examination.

*Maine:* Two liquor measures were introduced in this prohibition State designed to give pharmacists the privilege of selling liquor under certain restrictions. It is illegal now, and has been for many years, to dispense it even on a physician's prescription.

*Massachusetts:* A host of measures affecting pharmacists is brought forth at every ses-

sion of the Massachusetts Legislature. Of the fifteen or more introduced this year, not one of which became law, there were bills

1. Forbidding other than "registered pharmacists" from using this title.

2. Providing that no two members of the Board of Pharmacy shall reside in the same councillor district.

3. Arranging for the consolidation of the Boards of Pharmacy, Medicine, Dentistry and Health.

4. Removing from the Board of Pharmacy its power to regulate the sale of liquors by pharmacists.

5. Prohibiting pharmacists from carbonating soda water on the premises.

6. Prohibiting the sale of "patents" which contain more than one per cent. of alcohol.

7. Making it unlawful to expose registration certificates which have been revoked by the Board.

8. Providing for the abolition of the Board of Pharmacy.

9. Making provision for a sub-department in the Board of Health for the inspection of drugs.

10. Declaring that all "patents" shall bear their formulas on the label.

11. Changing the tenure of office of the members of the Board of Pharmacy.

12. Striking out the provision of the present law for a hired agent of the Board.

13. Prohibiting the mutilation of any marks or figures on packages of proprietary preparations.

14. Providing that face-bleaches which contain poisonous ingredients shall contain a statement on the label indicating the presence of such ingredients.

15. Prohibiting the sale or the giving away of opium.

*Michigan:* 1. A bill compelling pharmacists who sell liquors to pay a $500 tax.

2. A measure prohibiting pharmacists from using physicians' prescriptions for any other purpose than that for which they are originally written.

3. A bill permitting physicians to register as pharmacists without examination.

*Minnesota:* Ten or more measures were introduced in the Legislature of this State during the last session. All of them failed of passage. Among them were measures

1. Making seventy hours an average working week for clerks.

2. Providing that patent medicines which contain alcohol must state the exact percentage on the label.

3. Prohibiting the advertising of any preparation containing more than 1 per cent. of alcohol as non-alcoholic or non-intoxicating.

4. Providing that all poisonous liquors or drugs dispensed in quantities less than one-half gallon shall be put up in triangular cans, bottles or jars.

5. Rendering punishable the act of any druggist in substituting one preparation for another in dispensing a prescription.

6. Restricting the sale of cocaine to physicians' prescriptions.

7. Permitting physicians to register as pharmacists without examination.

8. Providing that preparations which contain more than 5 per cent. of alcohol shall be considered alcoholic beverages, and shall be sold only by dealers who pay a retail liquor-dealers' license.

9. Requiring all pharmacists handling liquors to be placed under a license of half the regular saloon license, and otherwise subjecting them to saloon regulations.

10. Compelling the Board of Pharmacy to choose its secretary from among the members of the Board.

*Missouri:* 1. A measure doing away with the Boards of Health, Pharmacy and Dentistry, by turning over their duties to the "Health Commissioner."

2. A bill requiring druggists who handle liquors to pay an annual State license of $:25.

3. Restricting the sale of morphine, cocaine, and chloral to physicians' prescriptions.

4. Directing a certain manner of labelling all medicines and compounds containing morphine, opiates, narcotics or poisons, except those sold upon physicians' prescriptions.

*Nebraska:* 1. A measure restricting the sale of cocaine to physicians' prescriptions.

2. A bill providing for the registration without examination of clerks who have had seven years' experience.

3. Permitting the registration without examination of "every person who had been engaged in the business of dispensing pharmacy on his own account for five years."

4. Providing for a reduction of the annual renewal tax.

*New York:* 1. No measure introduced in any State during the last year has aroused so much interest generally, and so much determined opposition among druggists, as the Bostwick-Dowling bill, which all but became law in New York State. This measure rendered the druggist amenable to criminal prosecution if he dispensed on a prescription the preparation of one manufacturer when the preparation of another had been specified. Though vigorously opposed at every step by the druggists of the State, it passed both houses and reached the governor. His excellency vetoed it after a hearing, at which both sides of the matter were discussed at length.

2. A poison-cork measure.

3. The Simpson bill, which would have given a country grocer the privilege of selling a full line of pharmaceuticals, including poisonous domestic remedies, providing they use original packages bearing the label of a registered pharmacist.

4. A bill preventing druggists and other dealers from carbonating water on their own premises.

5. The McManus bill, which sought to prevent proprietary medicine corporations from advertising falsely, and from using portraits of persons without their consent. A bill of the same type was killed two years ago.

*New Jersey:* Two measures were introduced in the legislature of this State, but the Secretary has not been able to discover their nature.

*Oregon:* The customary measure requiring the printing of formulas on the packages of all proprietary medicines.

*Pennsylvania:* 1. The customary measure directing that formulas of all proprietary medicines shall be printed upon the labels and packages thereof.

2. A bill making graduation from a college of pharmacy a prerequisite to examination by the Board.

3. A measure providing that none other than a registered pharmacist shall be permitted to manufacture preparations containing opium, cocaine and morphine, or whisky, brandy, wine or other intoxicating liquor.

4. A measure prohibiting the sale of preparations containing opium or its alkaloids, save upon the prescription of a physician.

*Rhode Island:* Grown weary of being prosecuted under charges of violating the State medical act, the pharmacists of Rhode Island vainly attempted to secure the passage of a bill so amending this act that it would not be considered a violation of it to recommend to customers "proprietary medicines and such articles as are commonly known as household remedies."

*Tennessee:* 1. The customary measure providing that the formulas of all proprietary preparations shall be printed on the labels and packages thereof.

2. A bill requiring all poisons to be dispensed in three-cornered, colored bottles.

3. A bill granting registration as pharmacists to those persons in small towns and rural districts who had been given special permits by the Board to sell medicines during the last three years.

4. A bill entirely removing these "permit" towns, or towns of less than 500 inhabitants, from the control of the Board of Pharmacy.

*Texas:* This State has a pharmacy act which provides, not for a single State Board of Pharmacy, but for district boards. An effort was made again this year to secure the passage of a law to overcome this source of confusion and lack of co-ordination. A satisfactory bill passed both houses of the Legislature, but, much to the disgust of the druggists of the State, was vetoed by the Governor.

*Virginia:* A liquor measure providing an annual tax of $25 under which druggists can sell liquor, on prescriptions only, and in quantities not exceeding one pint.

*Washington:* The customary measure requiring the manufacturers of patent medicines to print the formulas of their products upon the package.

*Washington, D. C.:* The drug clerks attempted to secure the passage of a "shorter-hour" bill.

*West Virginia:* A measure prohibiting the sale of cocaine and morphine except upon physicians' prescriptions.

*Wisconsin:* 1. A measure was introduced in the Legislature of this State which attracted great attention all over the country. It was aimed directly at the National Association of Retail Druggists, and, if made law, would probably have prohibited the operation of the tripartite plan in the State. It was introduced at the behest of a cutter, who had found that he could not receive goods, and who desired relief. Representatives of the N. A. R. D. and of the local associations sprang to the front, and the death of the measure was finally accomplished in the Senate, after it had passed the lower house.

2. The customary measure permitting physicians to register as pharmacists without examination.

3. A measure making several changes in the pharmacy act.

4. A bill permitting the unrestricted registration as pharmacists of all those who had had five years' experience prior to 1882, at which time the pharmacy law was enacted.

5. A measure permitting graduates in pharmacy to register without examination.

6. A shorter-hour measure introduced at the behest of the Wisconsin Drug Clerks' Association.

*Wyoming:* 1. A measure prohibiting the sale of cocaine, or any proprietary preparations containing the drug, except upon the prescription of a physician, this prescription not to be repeated.

2. A bill making it unlawful for any person except qualified pharmacists to practice the profession.

REGISTRATION STATISTICS FOR 1902–3.

| State. | Total on Rolls. | | Registered Last Year by Examination. | | Registered Last Year Without Examination. | | | | Graduates on Rolls. | Women on Rolls. |
|---|---|---|---|---|---|---|---|---|---|---|
| | R. P. | A. P. | R. P. | A. P. | Ph. G.'s. | M. D.'s. | For Other Reasons. | A. P.'s. | | |
| Alabama | 1114 | ..... | 28 | ..... | 3 | 15 | 6 | ..... | ..... | 2 |
| Arkansas | 1117 | ..... | 44 | ..... | 14 | ..... | 1 | ..... | ..... | 4 |
| California * | 2761 | 811 | 85 | 20 | ..... | ..... | 300 | | | |
| Colorado * | 800 | 52 | 81 | 17 | | | | | | |
| Connecticut | 900 | ..... | 95 | ..... | ..... | ..... | ..... | ..... | ..... | 20 |
| Delaware | 196 | 27 | 3 | 2 | 4 | 4 | 1 | 1 | 55 | 4 |
| District of Columbia | 927 | ..... | 9 | ..... | 39 | | | | | |
| Florida | 768 | ..... | 17 | ..... | 20 | 31 | 9 | ..... | ..... | 4 |
| Georgia | 1500 | ..... | 73 | ..... | ..... | 15 | 8 | ..... | ... .. | 6 |
| Idaho | | | | | | | | | | |
| Illinois | 4818 | 1089 | 290 | 143 | ..... | ..... | ..... | ..... | ..... | 100 |
| Indiana * | 5164 | 459 | 38 | 18 | ..... | ..... | ..... | ..... | ..... | 204 |
| Iowa | 3830 | 15 | 127 | ..... | 275 | ..... | ..... | ..... | 1000 | 75 |
| Kansas | 1494 | 50 | 80 | 7 | 32 | | | | | |
| Kentucky | 1850 | ..... | 85 | | | | | | | |
| Louisiana | 1156 | 308 | 61 | 26 | ..... | ..... | 10 | | | |
| Maine | 642 | 16 | 27 | 3 | ..... | ..... | ..... | ..... | ..... | 6 |
| Maryland | 919 | 164 | 90 | 4 | ..... | ..... | ..... | ..... | ..... | 20 |
| Massachusetts | 4122 | ..... | 96 | ..... | ..... | ..... | ..... | ..... | 300 | 15 |
| Michigan | 3246 | 377 | 126 | 108 | | | | | | |
| Minnesota | 1452 | 279 | 93 | 117 | ..... | ..... | 8 | ..... | ... . | 40 |
| Mississippi | 1015 | ..... | 31 | ..... | ..... | ..... | ..... | ..... | ..... | 8 |
| Missouri | 1555 | ..... | 47 | ..... | 98 | | | | | |
| Montana * | 262 | 16 | 22 | | | | | | | |
| Nebraska | 1403 | ..... | 73 | | | | | | | |
| Nevada | 57 | ..... | 1 | ..... | 2 | ..... | 11 | ..... | 3 | |
| New Hampshire | 714 | 104 | 18 | 11 | ..... | ..... | ..... | ..... | 15 | 2 |
| New Jersey | 1766 | 60 | 81 | 19 | ..... | ..... | ..... | ..... | ..... | 8 |
| New Mexico | 107 | 3 | 6 | ..... | ..... | ..... | 7 | | | |
| New York | 12272 | *430 | 385 | 35 | ..... | ..... | 12 | | | |
| North Carolina | 600 | ..... | 58 | ..... | ..... | 19 | ..... | ..... | ..... | 4 |
| North Dakota | 336 | 124 | 34 | ..... | ..... | ..... | 11 | 60 | ..... | 2 |
| Ohio | 3363 | 678 | 159 | 95 | ..... | ..... | ..... | ..... | 1205 | |
| Oklahoma | 381 | 1 | 58 | ..... | 2 | ..... | ..... | ..... | 66 | 12 |
| Oregon | 622 | 75 | 29 | 24 | ..... | ..... | ..... | ..... | ..... | 20 |
| Pennsylvania | 5915 | 2589 | 315 | 339 | ..... | ..... | ..... | ..... | ..... | 76 |
| Rhode Island | 284 | 182 | 4 | 29 | ..... | ..... | 50 | 9 | ..... | 4 |
| South Carolina * | 300 | ..... | 10 | | | | | | | |
| South Dakota | 508 | 36 | 41 | 9 | .. ..... | ..... | ..... | ..... | ..... | 5 |
| Tennessee | 1198 | 73 | 17 | 17 | ..... | ..... | 14 | ..... | ..... | 22 |
| Texas | 1590 | ..... | 40 | | | | | | | |
| Utah * | 281 | 45 | 7 | | | | | | | |
| Vermont | 364 | 1 | 12 | ..... | ..... | 4 | 9 | ..... | ..... | 2 |
| Virginia | 1250 | 250 | 52 | 20 | ..... | 11 | ..... | ..... | ..... | 4 |
| Washington * | 625 | 50 | 15 | 10 | 4 | ... .. | ..... | ..... | ..... | 12 |
| West Virginia | 1338 | ..... | 35 | ..... | 29 | | | | | |
| Wisconsin | 1578 | 435 | 46 | 70 | ..... | ..... | 13 | ..... | ..... | 40 |
| Wyoming * | | | | | | | | | | |
| Totals | 92459 | 8799 | 3171 | 1143 | 522 | 99 | 470 | 70 | ..... | 722 |

* Estimated.

Thus there are now about 92,459 registered pharmacists in the United States, and 8,799 assistant pharmacists. During the year 4,262 persons were granted certificates of registration as pharmacists: of these, 3,171, or 74 per cent., passed the examination; in 522 cases, or 12 per cent., graduation in pharmacy was accepted in lieu of the examination; in 99 cases, or 2.3 per cent., graduation in medicine was similarly accepted, and interchange of Board certificates accounts for nearly all the remaining 470 cases. Concerning assistant pharmacists, 1,143 were registered by examination and 70 without examination during the year. So far as the statistics go, they indicate the presence of but 722 women among the army of nearly one hundred thousand registered pharmacists in the country.

It must be understood, however, that these figures are, after all, only approximate. The greatest care has been taken in their collection and compilation, but no responses were received from California, Colorado, Indiana, Montana, New Mexico, South Carolina, Texas, Utah, Washington and Wyoming. Estimates for these states and territories have therefore been necessary, and though this has been made with as much patience and accuracy as the circumstances permitted, an element of uncertainty has been introduced which puts absolute correctness quite out of the question.

HARRY B. MASON, *Secretary.*

The report was received with applause.

THE CHAIRMAN: The Secretary's report is before you, gentleman. What is your pleasure?

MR. LOWE: I move that this most valuable report be received, with a special vote of thanks from the Section. Having been Secretary of the Section some years ago I realize fully what an immense amount of labor it was to the Secretary to compile and present these statistics and this *resumé* of the progress of legislation in the various States, which will be of incalculable benefit to the Association.

Mr. Eliel seconded the motion of Mr. Lowe, and it was put to a vote and carried.

The Chair announced as the next order of business reports from the standing committees, and said he had a report from F. E. Stewart as a committee of one, appointed for the purpose of transmitting the views of this Association on patents and trade-marks to Congress, but suggested that the Section was very much crowded for time, and the substance of this report was merely that Congress paid no attention to the recommendation of the Association—or practically none.

Thereupon Mr. Lowe moved that the report be received but not read, especially as it was already in print. This motion was put and carried.

The following is the text of the report:

## REPORT OF F. E. STEWART, AS COMMITTEE OF ONE APPOINTED FOR THE PURPOSE OF TRANSMITTING THE VIEWS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION ON THE SUBJECT OF PATENTS AND TRADEMARKS TO THE CONGRESS OF THE UNITED STATES OF AMERICA.

Authority was given me by the resolution of Dr. Bartley at the 1899 meeting to transmit the views of this Association on the subject of patents and trademarks to the U. S. Congress. These views were expressed by the Association in resolutions offered at the meetings of 1896–7–8 and 9, in connection with the work of the Special Committee on National Legislation, while I was its chairman. President McKinley appointed a commission to revise the U. S. patent and trademark laws under Act of Congress approved June 4, 1898. Acting as your representative, I attended the meetings of this Commission. The report of the Commission, known as Senate Document No. 20, is now in the hands of Congress. The Com-

mission ignored the wishes of this Association in its recommendations to Congress. The wishes of this Association are that Congress shall so revise the patent law as to exclude materia medica products from patent protection, and so revise the trademark law that the currently used names of materia medica products shall be refused registration.*

By referring to the report of the Commission, the following interesting points will be found :

First, in regard to patents. The report states that it has been urged before the Commission that the U. S. patent law should be so amended as to exclude from patent protection both medicines and chemical products generally, at least so far as such inventions are the inventions of subjects or citizens of the foreign countries which exclude these classes of inventions from patent protection, and it has been contended that subjects or citizens of foreign countries should not be permitted to receive in this country patents or inventions which are not patentable in their own country.

The countries which exclude medicines, chemicals and chemical substances from patent protection are Germany, France, Austria-Hungary, Italy, Japan, Denmark, Norway, Sweden, Portugal, Russia and a number of other countries.

At the present time, citizens of these countries are permitted by our laws to patent medicines and chemical substances in this country, and sell them at just as high prices as they can get by "booming" them in the medical press, and thus use the resources of the United States to build up great industries in their own countries. And we are prevented by the same laws from importing these substances from foreign countries and paying the duty on them to sell in competition with these foreign concerns which are fattening upon our country.

Further reference to the report informs us that the exclusion from protection of inventions relating to medicines, chemicals and foods, in the countries referred to, does not generally extend to those relating to processes or apparatus for their manufacture. In other words, the countries referred to take a similar position upon the subject of patenting materia medica products taken by this Association.

Against our position, the foreign manufacturers urge that while process patents are protective under a monarchial form of government, they are not protective in this Republic of ours. The validity of this objection is questionable in the light of the provisions of the German law, also in the light of the patent laws of several of the other countries referred to. Quoting from the German law of April 7, 1891 :

Sec. 1. Patents are granted for new inventions which allow of industrial application.

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* See Proceedings for 1897, p. 90, "Preamble and Resolutions," also Proceedings for 1899, p. 344.

Excepted are:

(1) Inventions the application of which is contrary to the laws or public morals.

(2) Inventions relating to articles of food, whether for nourishment or for enjoyment, and medicines, as also substances prepared by chemical processes in so far as the inventions do not relate to a definite process for the preparation thereof.

Sec. 35. * * * If the invention relates to a process for the production of a new substance, all substances of like nature are considered as having been made by the patented process until proof to the contrary is given.

I see no reason why the provision in the law which obliges those who go into competition with the original inventor to furnish proof that he is not infringing could not be put into our law also, and the restriction now existing, by which the patent is made to cover the product as well as the process, removed.

Second, in regard to trademarks. We learn from the report that neither the coining of a new name, nor its registration as a trademark, gives to the inventor thereof any proprietary rights whatever in the name, or in the preparation to which it may be applied as a title. The right to a trademark is acquired by adoption, not by invention. That is, if a manufacturer adopts a certain mark as his commercial signature, and uses it to mark his brand of goods so that purchasers may know the origin or source of the goods—that is, the laboratory or manufacturer from which it comes—he acquires a right to prevent others from using the same mark for the same purpose. But he acquires no right whereby he can prevent others from using the same mark on other classes of goods. There are about four hundred classes of goods recognized by the Patent Office, so four hundred manufacturers may use the same trademark.

The great reason why we object as pharmacists to any method whereby control is secured over the manufacture and sale of materia medica products is because it enables quacks to reap a harvest by misleading the people. Throw the products open to legitimate competition, and the nostrum business would soon become unprofitable.

Another reason is that it gives the uneducated and unprincipled quack opportunity to invade the field of legitimate medical and pharmacal practice and make a fortune out of his business, which, if conducted in an honest manner, could not long survive competition with the honestly conducted chemical and pharmacal industries.

The evils of this business were not so apparent to the pharmaceutical profession so long as pharmacists made money by handing advertised package goods over their counter. But the advent of the cutter fortunately opened the eyes of many pharmacists to the great danger threatening the pharmaceutical profession from the encroachments of the unlicensed practitioner.

It is not our desire to break down the wall of protection erected by the patent and trademark system around the chemical and pharmacal industries that animates us, as some would have it appear. The object of the patent law is to promote progress in science and the useful arts. Applied to pharmacy, the patent law should promote the advance of pharmaceutical education, improve the condition of the pharmacist and further the interests of the sick and suffering, or its true object is not accomplished. No person except the patentee of some new product will for a moment contend that the true object of the patent law is being attained by so applying it that the manufacturer is protected in fooling the public by misleading advertisements, or in building up the industries of foreign countries at the expense of our own.

The true object of the trademark law is to protect the public from counterfeit brand marks, so that people may be able to discriminate between the various makes of articles of commerce. The function of the trademark as a brand mark cannot be performed in the presence of a monopoly, for when only one brand is possible, what is there to distinguish between? The trademark system differs from the so-called proprietary system in this, namely, the trademark system stimulates competition between manufacturers of a known article to excel in quality, while the so-called proprietary system stimulates all that is dishonest and unfair in human nature, protects secrecy and fraud, and, by its unfair competition with pharmacy, has nearly ruined the vocation as a remunerative business.

THE CHAIRMAN: Gentlemen, the most important subject to come before this Section is the question of the cocaine evil and its restriction by legislation. We shall have two important reports on this subject, and the first of these is the report of the Special Committee on the Acquirement of Drug Habits, while the other is that of Mr. J. H. Beal as a committee of one on a model anti-narcotic law. We will first consider the report of the committee of which Mr. Eberle is chairman.

Mr. Eberle then presented in abstract the report of his Committee on the Acquirement of Drug Habits, the full text of the report being as follows:

## REPORT OF COMMITTEE ON THE ACQUIREMENT OF DRUG HABITS.

The knowledge of the appointment of the chairman of this committee came to him when he was possibly busier than usual, but as delay in appointing some one else might perhaps have taxed even a shorter period of time for some one who possibly had no more leisure hours than he had, persuaded him to accept the honor, and do the best he could under the circumstances. Mr. Frederick E. Whitcomb, who was apppointed a member of the committee, was necessitated to decline service for good reasons. Fortunately Mr. Frederick T. Gordon was able to assist, and his work was indeed most valuable.

The committee was placed in a position to use their best endeavor to interpret the duties which fell to their lot, and we hope that the deductions which are hereafter made will justify the means they adopted. May 30th we issued the following circular letter:

The above-named committee respectfully asks for your prompt co-operation. It is en-

tirely unnecessary to impress you with the deep concern which you have with us in obtaining direct data relative to this abuse, so that ways and means for controlling it may be devised.

Last year a committee for the same purpose elicited valuable information through the unusually prompt responses from physicians and druggists in designated localities. We now hope to meet with the same favor from the hands of those we address, and ask you to fill in the blank spaces of the enclosed sheet, and make such remarks as you may see proper in the premises on the reverse side.

Please obtain information bearing on the subject from physicians or other available sources, and if you have related items of interest to communicate they will be duly appreciated. If there are state laws or city ordinances in force in your locality, please furnish us with a copy, if possible, and comment on the success or means of evasion.

Your name will in no instance be used, and if you object to the committee knowing it, you may omit your signature.

In either event please give the matter your serious attention, make your report as accurate and complete as possible, and mail it to the chairman of this committee.

Anticipating your favor, we beg to express our thanks for an early reply.

Accompanying the letter we inclosed a report blank, which is no doubt familiar to most of you, asking for data regarding the number of habitues known, the drug addicted to, sex, color, whether parents or not, the number of inmates in asylums, if pay patients, or dependent upon charity, whether the number was increasing or decreasing, and also if habits were acquired from medicines and beverages of unknown composition, on the market. Fifteen hundred of these report blanks and letters were sent out, every State, and even Canada being favored. As a result, we received about one hundred and fifty replies, about one hundred being made out on the blanks inclosed.

July 9th we sent out about four hundred return postal cards to one or more persons in every State asking them to send them to hospitals, asylums, etc., as is indicated by the following:

The above-named committee is endeavoring to obtain information relative to the extent of the habitual use of narcotics, the results, etc. We will not use your name nor that of the institution, the object being to obtain data. We assure you that the greatest care will be exercised in this particular, and your favor will be sincerely appreciated. Please fill out the attached return postal at your earliest convenience, as our association meets on the 3rd day of August, and the return should be in the hands of the chairman not later than the 23d inst.

On the return card we asked for the number of inmates, sex, color, whether parents or not, the drug used, the number discharged as cured, what per cent. were charity patients, was the number increasing or decreasing, and how the habits were acquired. In response thereto we received thirty-four responses on the postal cards, and quite a number of reports of various institutions.

The reports which we could use in the statistics of sale numbered only ninety-one, and the figures can only be used for certain comparative deductions. It would be unreasonable to assume because we have a greater number of habitues reported from Texas, and a greater number of reports, that more of the drugs are used there than elsewhere because of the circumstances, and the same reasoning will apply with other figures; but of that more hereafter. We may receive additional copies from states not in the list, but as the time is approaching when our report must be completed by July 27, and for the further reason that they do not change any of the conclusions, we omit them. Before proceeding to a tabulation of the reports from asylums, etc., we wish to use some of the remarks made in conection with reports, or in lieu thereof.

Alabama reports out of about 150 drug habitues, eight with heroin habit.

Canada reports an increasing use of drugs and mentions paregoric especially on account of being exempted in the law.

Connecticut reports a physician who has treated over 1,200 cases in twenty-eight years; fifty per cent. were addicted to morphine, thirty per cent. to opium and preparations and fifteen per cent. to cocaine. The cases were not confined to Connecticut.

Georgia report says: Almost every colored prostitute addicted to cocaine; another a physician's prescription reading cocaine, 25 cents worth.

Indiana reports that a good many negroes and a few white women are addicted to cocaine.

Maryland reports the sale of cocaine by disreputable physicians; the purchase by a retailer of $500 worth in six weeks; of a small dealer who purchases on an average twenty-five ounces cocaine per week.

Michigan reports increasing sale to negroes.

Minnesota reports a case using several large bottles effervescing salts per week, a case using chloroform, ether, chloral, cocaine and morphine, trional users among the theatrical profession.

Ohio reports sales of jobbers to a few druggists only, which aggregate 600 ounces cociane per month.

Pennsylvania reports several heroine cases, another the purchase by a small retailer of 100,000 ¼-grain morphine pills at a time. The sale of cocaine in drinks by saloon men is extensively followed.

Virginia reports enormous growth of cocaine habit among negroes.

General reports indicate that the sale of narcotics is not restricted to any section of the country nor confined exclusively to the fallen and lower class. Information comes from several sources that in callings which demand many hours' work at a time or the hours of night, cocaine is resorted to for stimulation.

| STATES. | Number. | Men. | Women. | Children. | White. | Colored. | How many inmates in asylums of your state due to drug habit. | How many inmates in charitable institutions on account of drug habit. | How many habitues do you know who are parents. | Increasing. | Decreasing. | Opium (crude). | Opium (smoking). | Tincture Opium. | Tincture Deodorized Opium. | McMunn's Elixir. | Camphorated Tincture Opium. | Morphine. | Cocaine. | Tronal. | Acetanilid. | Sulfonal. | Chloral. | Headache Cures. | Chloroform. | Ether. | Phenacetin. | Cocaine and Morphine. | Paraldehyde. | Dover's Powder. | Average number habitues to each reporter. | Number of reports. | Are above described habits formed from the use of remedies on the market, the formula as of which are unknown? Answer with yes or no. | Are persistent, pernicious habits formed for beverages, containing medicinal ingredients and dispensed at the soda fountain? Answer with yes or no. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arkansas | 99 | 51 | 48 | 0 | 75 | 24 | 25% | | 16 | .... | 4 | 19 | 4 | 5 | 0 | 1 | 0 | 46 | 16 | 0 | 3 | 0 | 2 | 13 | 0 | 1 | .. | .. | .. | 25 | 4 | 2 yes, 2 no | 2 yes, 2 no |
| Arizona | 30 | 22 | 8 | 0 | 20 | 10 | ..... | ..... | 6 | 1 | 0 | .... | .... | .... | 2 | 0 | 0 | 13 | 2 | 0 | 0 | 0 | 1 | 12 | 1 | 0 | .. | .. | .. | 16 | 1 | no | no |
| California | 32 | 16 | 16 | 0 | 30 | 2 | ..... | ..... | 21 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 3 | 13 | 2 | 0 | 0 | 0 | 1 | 12 | 1 | 0 | .. | .. | .. | 16 | 2 | 1 no, 1 yes | 1 no |
| Canada | A very large number and increasing. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | ..... | ..... |
| Colorado | 21 | 11 | 10 | 0 | 20 | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | .. | .. | .. | 7 | 3 | 1 yes | ..... |
| Connecticut | 23 | 17 | 6 | 0 | 22 | 1 | ..... | ..... | ..... | ..... | 1 | ..... | 0 | 0 | 1 | 0 | 1 | 13 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | .. | .. | .. | 12 | 2 | no | no |
| District of Columbia | 23 | 19 | 4 | 0 | 12 | 11 | ..... | ..... | 5 | yes | .... | 1 | 2 | 6 | 0 | 0 | 1 | 9 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | .. | .. | .. | 23 | 1 | yes | ..... |
| Florida | 9 | 5 | 4 | 0 | ... | ... | ..... | ..... | ..... | ..... | ..... | 1 | ..... | ..... | ..... | ..... | ..... | 8 | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .. | .. | .. | 9 | 1 | ..... | ..... |
| Georgia | 83 | 40 | 43 | 0 | 65 | 18 | ..... | ..... | ..... | ..... | ..... | 21 | 3 | 9 | ... | ... | 3 | 39 | 8 | ... | ... | ... | ... | ... | ... | ... | .. | .. | .. | 17 | 5 | 3 no | ..... |
| Illinois | 40 | 12 | 28 | 0 | 32 | 8 | ..... | ..... | ..... | ..... | ..... | ..... | 5 | 3 | ... | ... | 1 | 8 | 15 | 1 | 2 | 2 | .. | 2 | 2 | 1 | .. | .. | .. | 10 | 4 | 2 yes | 1 yes, 1 no |
| Indiana | 35 | 12 | 23 | 0 | 31 | 4 | 2 | ..... | 24 | 3 | 2 | 8 | .... | 4 | 1 | .. | .. | 17 | 3 | ... | ... | ... | ... | 2 | 1 | ... | .. | .. | .. | 9 | 4 | 3 no | 3 no |
| Iowa | 5 | 3 | 2 | 0 | 4 | 1 | ..... | ..... | 4 | ..... | ..... | 1 | .... | ..... | ..... | ..... | ..... | 3 | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .. | .. | .. | 5 | 1 | no | no |
| Louisiana | 163 | 62 | 101 | .. | 111 | 51 | ..... | ..... | 4 | ..... | ..... | 4 | 20 | 11 | .. | .. | 4 | 40 | 61 | .. | 2 | 1 | 2 | 6 | .. | 2 | 3 | 8 | .. | 54 | 3 | no | no |
| Massachusetts | 5 | .... | .... | .... | .... | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3 | .... | .... | .... | 1 | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 5 | 1 | no | no |
| Michigan | 35 | 7 | 28 | 0 | 34 | 1 | ..... | ..... | ..... | ..... | ..... | 3 | 0 | 6 | .. | .. | 2 | 14 | 1 | 1 | 1 | 2 | 2 | 4 | .. | .. | .. | .. | .. | 4 | 10 | 1 no, 1 yes | 1 no, 1 yes |
| Minnesota | 39 | 18 | 21 | 0 | 39 | 0 | ..... | ..... | 14 | 1 | ..... | ..... | ..... | ..... | 1 | .. | 1 | 19 | 4 | 11 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 20 | 2 | 1 no, 1 yes | 1 no, 1 yes |
| Mississippi | 29 | 18 | 11 | 0 | 24 | 5 | ..... | ..... | ..... | ..... | ..... | 10 | .... | 2 | .. | .. | .. | 16 | .... | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | 29 | 1 | no | no |
| Missouri | 143 | 38 | 105 | 0 | 54 | 89 | ..... | ..... | 40 | yes | ..... | 5 | .... | 16 | .. | .. | 5 | 60 | 52 | 1 | 10 | .. | 5 | .. | .. | .. | .. | .. | .. | 24 | 6 | 2 yes, 4 no | 2 yes, 4 no |
| Montana | 85 | 57 | 28 | 0 | 70 | 15 | ..... | ..... | 9 | yes | ..... | 5 | 20 | 2 | .. | .. | .. | 57 | 52 | .. | .. | .. | 7 | .. | .. | .. | .. | .. | .. | 42 | 2 | ..... | ..... |
| Nebraska | 14 | 7 | 7 | .. | 9 | 5 | ..... | ..... | 8 | yes | ..... | ..... | .... | 1 | .. | .. | .. | 6 | 7 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 14 | 1 | no | no |
| New York | 155 | 147 | 8 | .. | 149 | 6 | ..... | ..... | 3 | yes | ..... | 3 | 100 | 1 | .. | .. | .. | 30 | 1 | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | 78 | 2 | yes | yes |
| North Dakota | 0 | 0 | 0 | 0 | 0 | 0 | ..... | ..... | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | ..... | ..... |
| Ohio | 26 | 5 | 21 | .. | 26 | 0 | ..... | ..... | 3 | yes | ..... | 2 | .... | 6 | .. | .. | .. | 16 | .... | 1 | 1 | 1 | 2 | .. | .. | .. | .. | .. | .. | 9 | 3 | no | no |
| Pennsylvania | 29 | 10 | 19 | .. | 29 | 0 | ..... | ..... | 13 | yes | ..... | ..... | .... | 8 | 1 | 1 | 1 | 10 | 4 | 1 | 1 | 1 | 3 | .. | .. | .. | .. | .. | .. | 6 | 5 | no | no |
| South Dakota | 5 | .... | 5 | 0 | 5 | 0 | ..... | ..... | 2 | .... | ..... | ..... | .... | ..... | ..... | ..... | ..... | 5 | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 3 | 2 | ..... | ..... |
| Texas | 652 | 148 | 504 | .. | 165 | 489 | 6 | 6 | 15 | .... | yes | 8 | .... | 51 | .. | .. | 17 | 259 | 216 | 3 | 10 | .. | 6 | 18 | 2 | .. | .. | 1 | 1 | 41 | 16 | yes | yes |
| Virginia | 5 | 3 | 2 | .. | 4 | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .... | .. | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | no | no |
| Washington | 13 | 3 | 10 | .. | .. | .. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 2 | .. | .. | .. | 6 | 2 | .. | .. | 1 | 1 | 1 | .. | .. | .. | .. | .. | 3 | 4 | no | no |
| Wisconsin | 13 | 3 | 10 | .. | 8 | 5 | ..... | ..... | 2 | .... | ..... | 1 | .... | 1 | .. | .. | .. | 7 | 4 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 13 | 1 | no | no |
| Totals | 1811 | 723 | 1083 | 0 | 1036 | 748 | 36 | 6 | 185 | .... | .... | 101 | 149 | 148 | 4 | 2 | 42 | 725 | 456 | 19 | 31 | 11 | 23 | 67 | 9 | 5 | 4 | 8 | 1 | 511 | 91 | ..... | ..... |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5.1% | | | |

Only twenty-six of the return postals are in shape to make percentage reports.

| STATES. | Number of Men. | Number of Women. | Per cent. men addicted. | Per cent. women addicted. | Per cent. discharged as cured of habit. | Per cent. Charity Patients. | Increasing. | Decreasing. | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|
| **INSANE ASYLUMS.** | | | | | | | | | |
| One report for each name. | | | | | | | | | |
| Arizona | 182 | 37 | 3 | 1 | 2 | 75 | yes | .... | Morphine, cocaine and alcohol taken as stimulants by gamblers. |
| Connecticut | 70 | 80 | 15 | 1⅔ | 30 | 4 | yes | .... | Chiefly alcohol, morphine and cocaine. |
| Delaware | 340 | 190 | 8 | 15 | few | all | yes | .... | Morphine, chloral and cocaine. |
| Illinois | 596 | 637 | | | | | | | |
| Maryland | 290 | 260 | 1 | 1 | | | | | |
| Michigan | 626 | 600 | 1 | 1 | few | 0 | .... | .... | Self acquired. |
| Minnesota | 475 | .... | 1 | 1 | all | .... | .... | .... | For relief of pain and insomnia. |
| Mississippi | 194 | 190 | 1½ | ½ | none | all | .... | yes | |
| Missouri | 291 | 211 | ¼ | ¾ | 50 | all | .... | .... | ¾ opium, ¼ cocaine. |
| New York | 416 | 768 | none | | | | | | |
| New York | 853 | 961 | ..... | .... | .... | .... | .... | .... | Only insignificant per cent. |
| New Jersey | 420 | 568 | ..... | .... | .... | .... | .... | .... | 18 per cent. addicted to alcohol, morphine and cocaine. |
| Texas | 683 | 607 | 6 | 7 | all | all | yes | ... | Opium and cocaine to relieve pain. |
| Virginia | 550 | 580 | 1 | 1 | | | | | |
| Totals | 5986 | 5689 | 37¾ | 29 5/12 | 282 | 479 | | | |
| Average | 428 | 438 | 3.8 | 3 | 35 | 69 | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Penal Institutions.** | | | | | | | | | |
| One report for each name. | | | | | | | | | |
| Pennsylvania (House of Correction). | 723 | 172 | 1 | 1 | all | all | yes | | |
| Texas (House of Correction). | .... | .... | ..... | .... | .... | .... | .... | .... | None. |
| Texas (Penitentiary). | 520 | .... | 50 | .... | all | .... | .... | .... | Whiskey and cocaine. |
| Wisconsin (State Prison). | 544 | 11 | 7.2 | 10 | all | .... | .... | .... | Cocaine 16, cases morphine 18, smoke opium 4, chloral 2; no drugs allowed, therefore cured when discharged. |
| Totals | 1787 | 183 | 58.2 | 11 | 100 | 100 | | | |
| Average | 596 | 91 | 19.4 | 5½ | 100 | 100 | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sanitariums and Hospitals.** | | | | | | | | | |
| One report for each name. | | | | | | | | | |
| Florida | 15 | 30 | 1.3 | 3.8 | 25 | 75 | .... | .... | 5 children, 20 parents; parents addicted 2 per cent.; chloroform, trional, tinc. opium, alcohol. |
| Florida (Private Hospital). | 1 | 3 | ..... | .... | 75 | 0 | .... | .... | Tincture opium, alcohol. |
| Illinois (Private Hospital). | 16 | 5 | all | all | 90 | 10 | yes | .... | 16 parents; 5 per cent. cocaine, 30 per cent. alcohol, 65 per cent. opiates. |
| Indiana (Private Hospital). | 10 | 20 | 10 | 10 | all | none | yes | .... | 3 parents; physicians and persons engaged in literary pursuits using same for rest or stimulant. |
| Missouri | 75 | 150 | 7.5 | 3 | 20 | 30 | yes | .... | Nervous prostration, physician's prescription. |
| Pennsylvania | .... | 17 | ..... | 33⅓ | few | .... | .... | .... | Association. |
| U. S. Hospital | .... | .... | ..... | .... | .... | .... | .... | .... | None. |
| Totals | 117 | 225 | 117.5 | 152 | 310 | 115 | | | |
| Average | 23 | 38 | 29 | 30 | 50 | 30 | | | |

From other report cards we gather the following: Six stated they did not treat drug

habitues, therefore kept no record; one that they treated out-patients only and could give no accurate figures; an institute for feeble-minded women in New York had no habitues; a home for boys in New York had many youths addicted to tobacco, none to drugs; the latter was said of a report from a girls' home in Pennsylvania; another from Pennsylvania stated that they kept no information of this character, that if addicted they were forced to stop it here. There is little to be gathered from annual reports of asylums for the reason that no close record is kept of this, very frequently being only incidental to the cause; there are a great many cases referred to as "cause unknown," where possibly many cases, not otherwise noted, exist. In a report from Georgia we find eight cases of morphioma nia, two in a report from Kentucky; Michigan reports eighteen from intemperance, narcotics included; Montana reports seven cases, all morphine, three using in addition cocaine and one smoking opium. One New York hospital reports five men and four women addicted to the drug habit out of 1700 patients, and states that all the cases have used opium in some form, and one man in addition cocaine. In addition to this a report from New York covering eight years, concerning 35,299 cases there were 128 women addicted to the drug habit. Pavilion for the Insane, Belleview, and allied hospitals for three months, in 587 cases, reports two females with toxic insanity due to morphine. Texas reports three cases in addition to those referred to in the schedule Washington refers only to three cases, and Wisconsin six. An institution devoted to the treatment reports on nearly 3,000 cases treated, covering a period of several years, the inmates being from twenty-two states, and also upon 100 morphine users, who consumed all the way from one grain to three-eighths ounces per day. The endorsements of this institution are good, and they claim relapses of only twenty-five per cent.

We have quite a number of letters from institutions of this character, and some of their reports are interesting, but not suitable for this report, any further than to state that in almost every city of, say 100,000 inhabitants, there are places of this kind, indicating the extent to which the evil exists, even among those who are willing to be cured, if possible. The fees charged by these homes vary from $30 to $200, and from home to a hospital treatment.

From city jails we have quite a number of incomplete returns, all of them indicating that the dockets are daily interspersed with charges against offending drug fiends. A most interesting report furnished me by the chairman of last year's committee and from Dr. George L. Wilkins, of the Baltimore city jail, is so comprehensive that it is worthy of a place in these records; but, to avoid space, I will endeavor to condense the report, and hope not to destroy its value. The period involved is only brief, and relates to forty-seven individuals, all women with the exception of four, and nearly all colored. The oldest female was forty-five years, youngest twenty-one, the average age twenty-four; the oldest male sixty years; youngest, twenty-eight. Ten of the above were married. In six cases the drug was prescribed by physicians; in five cases crime was committed to obtain the drug. Nine used morphine, seventeen cocaine, sixteen used both, two laudanum, two morphine and laudanum, and the others all. Two used all methods applied in its use; in the other instances, morphine was taken by mouth and cocaine in nose.

The doctor states that they invariably stop the use of the drugs without any paticular ill effects. For fear that the assertion may be omitted where it possibly more properly belongs, we make it here, namely, that those who think they cannot break themselves of the habit are those who are free to obtain the drug by purchase or otherwise.

Acquirement of the drug habit is a subject that we must carefully look into if we would take steps to stop it.

The United States Government permits the importation of smoking opium for no better reason than the vendor has for selling it, who excuses himself by saying: "If I don't, my neighbor will. The public has not been benefitted; I have allowed my competitor to take my profit."

Some patent-medicine manufacturers want to impress the consumer with the immediate relief idea—nothing like cocaine for one who suffers with catarrh; nothing like an opiate for a pain; nothing like a stimulant to revive the patient who has become despondent over his supposed ailment. They have found the way to health, and tell their friends about it, who help them spread the news, and soon we have a testimonial and a picture in our great dailies. If these combinations are good, and in reality only one of the ingredients does the work, why not take it by itself. We have now created an habitue in embryo.

A physician is called for the first time to a well-to-do home. A practice might be secured which would be valuable if he can only show his ability, and he does—there is not very much pain in the prick of a needle, and the result is so quick, so calming—wonderful man,—the patient begins to improve at once.

Society's whirl demands late hours—a little punch; perhaps salad. Sleep must be immediate, or the man of business will not get any. There are medicines that will produce it quickly; the prescription can be refilled as occasion demands. The next day a severe headache occurs—no trouble to relieve that; so convenient that many carry it in their pocket, because the headache comes so frequently.

The man of business must develop the idea which is to yield an extra profit quickly, gain the advantage over his competitor. This may make him nervous; but what of it? That can be remedied by the physician. Perhaps he saw an advertisement of a remedy in the paper that would do it, or a friend told him what he is using for the same trouble.

The pain, irritation, itching, inflammation and other annoyances yield to the influence of some of these delusive drugs; an ointment, a spray, a suppository, all have had their victims.

A medicine is perfectly harmless (?) because it is taken at the soda-fountain; it is easily taken, it makes one feel so bright.

The lawyer must have his brain yield its utmost; the preacher must make his sermons interesting. Constant strain evidences itself, and this must be corrected at once, and it can be, and once more they exhibit even greater fluency than before.

Shall we carry this idea forward to the generation which follows? It is needless; the nursing babe absorbs medicine from its mother's breast as it draws its nourishment; it becomes an habitue from its birth. My mother takes this, and I will try a little of it, is another trend of the habit, as well as other associations in various walks of life. The negroes, the lower and immoral classes, are naturally most readily influenced, and therefore among them we have the greater number, for they give little thought to the seriousness of the habit forming.

I have before me a report from New Jersey. A mother purchased morphine pills several times a week; her son acquired the same habit. Another mother takes laudanum; now her daughter does the same. Nearly all report headache-remedy habitues. One says: "If that is a habit I have about one hundred. I sell about eight gross per year." A Dover's-powder habitue was new to me, but, knowing the reporter personally, I entertain no doubt whatever. Diarrhœa remedies are reported in habitual use by quite a number. One reports a whole family, including young children, addicted. They quickly become morphine and laudanum users. Quite a number report addiction due to physicians in being too ready with the hypodermic injections, and suggesting to the patient to send for a few morphine pills. We have many reports expressed in the following, which we copy verbatim from an Indiana letter: "The most deplorable condition pertaining to the drug habit of late years is that many of the leading lights in the medical profession should become slaves to a vice which they are supposed to combat." Another writes that quite a number of habitues of his locality lay their acquisition to two physicians, who were habitues themselves. This result is natural, but deplorable. The other addictions are ascribed to the use of patent medicines, already described and exhibited in about thirty-eight letters and reports.

I have not devoted any space to the lower walks of life, and will quote two in part. One from Montana reads: "Most drug fiends of this section come from the Pacific coast. They commence with smoking opium, which becomes too expensive and consumes too much time, so they eat morphine; then they use it by injection, because it goes further; then they tip their injection off with cocaine, because it deadens the pain, and gradually they use more cocaine than morphine." The other report carries with it the same idea relative to morphine and cocaine, and says, further, that cocaine fiends are vicious, but that the habit is not as chaining as morphine.

Reviewing now the reports received, we cannot say that they are as satisfactory as we had reason to expect. We did not expect very satisfactory returns, having had experience heretofore, and for this reason, more than any other, sent the blanks to all portions of the country, so that if we received any it might at least be shown that the habit was confined to no particular portion of it. This, we believe, has been clearly evidenced. We believe, also, that the proportionate use of the different drugs is fairly authentic. The number of habitues reported in asylums, prisons, etc., is not of any special value, because no accurate record is kept, and we believe that States should exact it. This is a matter of very large expense, of grave importance to the public, and their interests should be protected. The deductions evidence an equal addiction, regardless of climatic influence, and if we have pointed out the necessity of record in public institutions of habitues, and the suggestion is accepted and heeded, we will even consider this effort not to have been in vain.

We are confident that the use of narcotics is increasing, and that evil effects from it will come to succeeding generations. While the increase is most evident with the lower classes, the statistics of institutes devoted to the cure of habitues show that their patients are principally drawn from those in the higher walks of life. Occasionally we have received letters which were a relief, indeed, and we quote one: "This old Dutch bailiwick seems to be made up of a sober, industrious, God-fearing, law-abiding, democratic voting people, given to no bad habits."

Statistics are difficult to obtain, and we suggest that if it ever again seems expedient to obtain them, that one person in a locality be asked to secure the information. Give him plenty of time, so that he can gather it through conversation and observation, and then report fully, not for himself, but for the community of which he is a component part. It is to be observed that if we had obtained numerous statistics from one locality that many habitues would have been duplicated, but with this condition we were not burdened. We have a report on a physician who has used ten grains of trional and ten grains of sulfonal every day for several years, without increasing the dose, and no apparent ill effect. This seems remarkable to us.

Statistics of imports of opium, morphine, cocaine and chloral during the fiscal years 1901, 1902 and 1903 (nine months):

COCAINE SALTS.

| | |
|---|---|
| 1901 | $176,948 |
| 1902 | 254,704 |
| 1903 | 199,826 |

NOTE.—The imports of cocaine salts are given only in the shape of the value of quantity entered at the custom-houses.

There is an increase of $77,756 in the value of cocaine imported in 1902 over that for 1901, of $67,115 for the equivalent of the nine months of 1903 reported. Averaging $3 an ounce as the value of the cocaine, this gives us an increased importation of 25,920 ounces in 1902 and 22,372 ounces for nine months of 1903—a fact that speaks volumes in itself!

CRUDE OPIUM.

| | |
|---|---|
| 1901 | 491,448 pounds |
| 1902 | 548,673 pounds |
| 1903 | 338,937 pounds |

An increase of 57,225 pounds in 1902 over 1901; 1903 data incomplete. The values were $660,627 for the portion of 1903 reported.

SMOKING OPIUM.

| | |
|---|---|
| 1901 | 139,519 pounds. |
| 1902 | 163,441 pounds. |
| 1903 | 140,964 pounds. |

There was an increase of 34,511 pounds in the amount of smoking opium imported for the portion of 1903 reported, this drug seeming to be steadily increasing in amount consumed here. The value of the smoking opium imported for nine months of 1903 was $871,716.

MORPHINE SALTS.

| | |
|---|---|
| 1901 | 50,698 ounces. |
| 1902 | 38,002 ounces. |
| 1903 | 119,697 ounces. |

CHLORAL.

| | |
|---|---|
| 1901 | 4,485 pounds. |
| 1902 | 26,977 pounds. |
| 1903 | Not yet reported. |

We are unfortunate in not having a report on the importation of coca.

Legislation is the important factor to control the increasing vice, and from the tone of all letters, even those who do a large business in this line, there is at least a general conviction that it must be done. We will quote from a few: "The importation of smoking opium should be stopped." "Absolute withdrawal of the repeatedly-offending druggists' license is the only remedy." "Prevent the sale of the narcotics except by licensed pharmacists on a physician's prescription, which should be registered and kept for inspection." 'Let us restrict the sale of the narcotics first and afterwards the patent and proprietary medicines containing them." "Let the physician be prosecuted as well as the druggist, if aiding the habit." Denver reports: "In this city we have a very stringent city ordinance, in addition to the state law, prohibiting the sale of opium and cocaine, and it is made an offense by the city ordinance to sell either of the above drugs without the authority of a prescription from a reputable physician. This ordinance has been followed up by detective work by the Wayside Mission—which, by the way, is a charitable institution of this city for caring for the victims of this habit—and it has become, if not impossible, quite difficult for victims of the above drugs to obtain supplies. They are, of course, obtainable, regardless of the law, but under such police surveillance as to bring the sale down to a minimum."

No doubt Professor J. H. Beal, to whom the model cocaine-law has been referred, will call attention to restrictions in the various states, and to refer to these here would simply mean repetition. The chairman believes that stringent state legislation providing fine and imprisonment, with surrender of license to practice medicine and pharmacy, is the best means to control this vice. Legislation has a tendency to increase secret sale by individuals, therefore various kinds of punishment are necessary. You are no doubt aware that in the larger cities, and possibly in the smaller, cocaine is served on request in drinks, and indications are that in places of this character all these drugs are supplied.

The concluding remarks which the chairman would make are interwoven in some of those made by his colleague and are the result of his careful study and investigation. They follow:

### OPIUM AND MORPHINE USE.

Careful study of data personally collected and from reliable sources, forces the conclusion that the habitual use of opium in its various forms is increasing and that this increase is confined to no one class or occupation. A majority of the class known as "habitual criminals," and those men and women whose offenses against law and morality bring them often into the police courts, seem to be drug habitues, according to the testimony of police authorities and hospital surgeons. The fact that most of these people have become users of drugs *after* they had joined the ranks of the "under world," does not lessen the danger to society of the situation. The testimony is almost unanimous that a criminal or a member of the class that preys on society who is a "drug fiend" is the hardest to reform, more often slips back into a criminal life and even after a period of respectability will commit crime to obtain money to purchase the favorite drug if out of work and unable to procure it. The use of narcotics also blunts their moral sense so that few even desire to reform, being satisfied with any kind of life that permits them to get and enjoy their drug. So serious is this feature of the question of drug abuse that the writer earnestly urges that legislation be secured to entirely prohibit the sale of narcotic drugs to certain classes of people—such as the demi-monde, known criminals, or those whose occupation is "shady." Of course, it is hard to decide what a man is by looking at him, but druggists in certain localities in large cities certainly learn to know the class of their customers.

The weight of evidence seems to be that an habitual drug-user is more apt to succumb to temptation than a non-user; their moral sense is blunted, and an exaggerated sense of selfishness and personal gratification causes them to place their desires or seeming welfare above all else.

While it has not been practicable to obtain exact figures, it can be stated that the drug habit is alarmingly increasing among the men of our army and navy. The number of men using opium in the army has greatly increased since the occupation of the Philippines, many "opium-smokers" acquiring the habit there from Chinese or natives. The smoking of opium by the men of the navy does not seem to be as prevalent as in the army, gum opium "pills" or morphine being the way in which the drug is mostly used by sailors. Quite a number of enlisted men have been discharged from both army and navy during the last year because of their being detected as habitual users of opium or morphine—probably several hundred per cent. more during the last five years than for any ten years previous. To the best of the writer's knowledge—and he has carefully inquired into the facts—practically all the cases of drug habitues in both army and navy arise from the men learning the habit from natives of foreign countries or from lewd women and men in this country. Not a single case of drug-habit coming from the prescribing of an opiate by a medical officer can be recalled, opium and allied drugs being very guardedly and carefully used by army and navy medical officers. A goodly percentage ot the cases are men who have acquired some drug habit prior to enlistment, while a few—sad to say—are from the men of the hospital corps, who drifted into the habit from constant opportunity and handling of the baneful drug.

At present it is calculated that there are over a *million* opium-smokers in the United States, the importation of opium for smoking purposes being double that for medicinal uses, amounting to more than 500,000 pounds last year, valued at $3,500,000.

### COCAINE HABIT.

The frightful effects of cocaine on users of this very "devil-drug" have been so often and graphically told that it is hardly necessary to retell the story. One peculiar feature

of the cocaine habit noted by the writer is that one of the first signs of the use in a person is that the habitue loses all care for personal appearance or neatness, and a man formerly the pink of neatness, soon becomes noticeably slovenly in dress and appearance. There does not seem to be anything yet discovered that has as baneful an effect on the user as does cocaine. The writer has seen this drug literally turn a bright, high-principled man into a sneak thief and liar, absolutely without regard for morality or principle. One redeeming feature there is—the habitual use of cocaine seems to lessen both sexual desire and ability, so there is less danger of its transmission by heredity.

The evidence seems to point to the startling fact that nine-tenths of the cocaine habitues have fallen victims to its influence through the use of prescriptions or patent medicines containing the drug. Those who deliberately begin the use of cocaine mostly seem to do so through example or teaching of others, or from having read accounts of the wonderful stimulating properties cocaine has on the mind and the body. The use of cocaine seems to be rapidly supplanting in part the use of morphine among men and women of the "under world," and the writer knows personally of two cases of men who acquired the cocaine habit from lewd women they visited habitually. A very common form in which cocaine is used by this class is that of a "snuff," the cocaine being finely powdered and diluted with some inert powder, this being a conveniently portable and easily-used form. A powder containing fully fifty per cent. of cocaine is sold in large quantities to a certain class of men and women—the "powers that prey"—under the name of "Brighteye," from the effect of the drug in giving the eyes a temporary brilliancy.

Most of the cocaine used by these people they buy undisguisedly as such, there being plenty of drug stores where they can buy cocaine, morphine, etc., as easy as Epsom salt. The writer knows of one drug store in Philadelphia where regular customers can enter and get cocaine without any formality but the payment of its price. Holding up one finger means the party wants a "five-cent powder"; two fingers, ten cents' worth; three, fifteen cents, and so on, the mere holding up of the fingers in the initiated way being enough. This druggist buys cocaine in 100-ounce lots—from a supposedly reputable (?) manufacturer! Personally, the writer is sorry to be forced to admit that the majority of drug stores will fill a prescription calling for cocaine, even in unusual amounts, with little remark save saying "the price of this will be a little high." In one large Eastern city out of about twenty-five stores visited, only in four was there any question as to having a prescription calling for fifteen and twenty grains of cocaine "to be used as directed, in eyes," etc., put up and handed him. Not even a word of caution as to the nature of the drug was vouchsafed. This is not an accusation or a sensational assertion, it is simply the statement of actual experience.

It has seemed to the writer after a little delving into the facts of the supply of drugs to habitues that the retail druggist is far less to blame than the manufacturer or wholesale dealer. While many druggists are careless in selling drugs, and salve their conscience when selling to a "fiend" by saying: "If I don't some one else will," very few retailers actually make a practice of supplying drug habitues or bidding for their trade. On the other hand, when a manufacturer or jobber supplies a small retail drug store with pounds of morphine and cocaine every month, can it be said they do not know the reason for such unusual orders? One store in Philadelphia, a store doing little prescription and no hospital business, buys cocaine in 100-ounce lots, almost monthly. What must be the moral principle of the wholesaler who supplies such a drug store with such a self-advertising, criminal purchase? Before we punish the little fellows, we should begin higher up and put behind the bars the criminals who make it possible for the little fellows to carry on their nefarious trade. They can only plead ignorance by acknowledging themselves unfit to deal in such articles, but their real excuse is that they "want the money."

If it is possible to enact laws to prevent the retail sale of narcotic drugs except under certain conditions, it certainly seems feasible to enact a law that will prevent persons in the guise of retail druggists obtaining cocaine, morphine, etc., in quantities utterly beyond reasonable needs of their business. It might chafe some to be compelled to show how much of a certain article they used in their legitimate business, but it is already done by the National Government in one form in the manufacture and sale of alcohol and tobacco, and any one who has at all studied the question of drug abuse realizes that alcohol is fast becoming a far feebler power of evil than narcotic drugs. The writer may be emphatic, but he has seen enough of the evils coming from the abuse of drugs to make him fear that, unless very stern and speedy action is taken *now*, the people of the United States will pay dearly for their neglect in the no distant future. And he has little faith in an appeal to the moral sense of the men who are to-day supplying the retail drug stores with all the drugs they can sell, nor of the class of druggists who supply the "dope fiends." There is but one appeal to such men, and that is through fear—fear of their pocket-books or fear of jail—and the only way to stop them from continuing their practice is to make the penalty severe enough to be adequate to the danger of their crime and then administer it unsparingly. A murderer who destroys a man's body is an angel beside one who destroys that man's soul and lets the body live for crime.

And there is another feature demanding our attention—that is, the recognition by the law of the fact that many drug fiends delight in teaching others the use of their favorite drug, and the enactment of some legal means for checking this danger by adequate punishment of the guilty The writer has learned of too many cases where persons have learned the use of a drug from an habitue, and he believes that this factor in the increase of drug abuse has not been properly considered. It is certainly worthy of careful study and prompt action to prevent it effects from becoming still more alarming.

It may seem pessimistic, but the facts certainly seem to bear out the assertion, that the only remedy for the present widespread increase in the use of narcotic drugs is in the enactment of stringent laws to throw as many difficulties as possible around the obtaining of such drugs for *any* purpose, the provision of exceedingly severe penalties for the sale of narcotic drugs for any purposes but medicinal, and for any advice, practice or teaching that will cause non-users to become habitues and *rigid enforcement of every penalty to its full extent.* When one considers the number of ruined lives and homes caused by our loose laws and practices, the price of a little inconvenience or annoyance in the obtaining of some drug for lawful purposes seems a very small one to pay.

The committee wishes to thank all of those who have given them information, and also the journals who so willingly communicated their request to the fraternity.

Respectfully submitted,

FREDERICK T. GORDON,
E. G. EBERLE, *Chairman.*

After he had finished the presentation of his report in abstract Mr. Eberle explained that owing to the fact that the members of the committee lived so wide apart it was impossible to make a combined report, so he had made out the statistical part of the report, and Mr. Gordon had recorded his views in the latter part of the report. The committee was the recipient of applause upon its work, and on motion of Mr. Ebert the report was ordered received and adopted.

Mr. Caspari said he thought it would be well for the Section to ask the Association to provide for 1,000 reprints of this report, and thus avoid the necessity of going to the Council for authority; that there had been a large demand last year for reprints of the report of the Committee on

Drug Habit, and he thought that demand would probably be repeated. On motion of Mr. Ebert it was so ordered.

MR. SHEPPARD: I have no suggestion of change to make in the paper which has just been read before us, but if I were to make such I would suggest that the statement the committee, whose chairman is from *Texas*, incorporates there about "respectable Democratic people" be changed to "respectable Republican people."

MR. EBERLE: I would say that this comes from a gentleman in a Republican State.

MR. EBERT: I simply want to say that I have been trying to sell as limited an amount of narcotics in my business as possible. I do not believe in prohibition, and never have, though I have come before this Association and said I did not believe in liquor being sold in the drug store; that is the only thing I should like to see prohibited, and I am satisfied it would be impracticable to prohibit the sale of narcotics. But we should have laws to regulate this traffic, and if we could regulate it so as to stop this sale of five and ten cents' worth at a time—this running into drug stores and getting a few cents' worth of a narcotic—and compel its sale in larger quantities, and possibly in original packages of some kind, so it would cost more money and be harder to get, I think it would be a good thing. Now let me tell you of a little incident that occurred in my store just before this meeting: A lady came in and asked for a private conversation with me, and I accorded it. She said: "I know I have not traded at your store, but I would like to have a favor from you. Where I have been buying my cocaine I have been unable to get any since the law went into effect, and I want you to get a $5-package for me." I said, "Madam, I cannot do that; I cannot sell you cocaine. I am surprised that you use it; you ought not to use it." "Yes," she said, "I ought not to use it, but I will tell you why I do. I am an habitue of whiskey, and I have tried to stop myself from drinking whiskey, and cocaine is the only thing that prevents me from drinking it, and it does not do me the harm that whiskey does. I come to you to get that because I really use only a small quantity, and it prevents that craving I have that I must satisfy if I do not use cocaine." This was news to me, and I bring it here for what it is worth. If the cocaine evil is less than the whiskey evil—which I do not know about—we might take this aspect of the matter under consideration.

The Chair then called on Mr. J. H. Beal to present his draft of a proposed anti-narcotic law as bearing upon the cocaine evil.

MR. BEAL: Mr. Chairman and Gentlemen, the motion in regard to this model law as it passed last year—and, by the way, was passed in my absence, or I trust I should have escaped this responsibility—did not pass in the form originally proposed. As originally proposed, it applied simply to a draft of a law to regulate the sale of cocaine; but as put to the Section and adopted, it provided for a general anti-narcotic law, and this will account for the title of my paper.

Mr. Beal then read the following:

## AN ANTI-NARCOTIC LAW.

BY J. H. BEAL, SCIO, OHIO.

Socrates says that the penalty which the good must suffer for not taking part in the government is that they must live under the government of worse people than themselves. We may apply the aphorism to pharmacy

in this wise: If the druggists of the United States do not resolutely take hold of the regulation of the sale of narcotic drugs, and take the lead in procuring effective legislation restricting the sale of drugs, they will merely be turning it over to the care of people who are less competent to deal with it than themselves, and whose efforts at legislation are more likely to be inspired by righteous motives than they are to be attended by satisfactory results.

Before beginning the actual draughting of the form of law given below, the writer sent out a large number of letters to those believed to be interested in pharmaceutical legislation asking the opinions of the persons addressed upon the subject of an anti-narcotic law. The replies received indicate a wide difference of opinion even upon vital points. These opinions probably reflect the general condition of sentiment the country over, and go to show that any measure to be enacted into law must be more or less of a compromise, until time and experience shall indicate just what provisions are most efficient in reaching the desired results, and will be least burdensome upon those who desire only to do a legitimate business in the sale of narcotic drugs.

## THE LIMITATIONS OF LAW.

At the outset we are confronted by a popular misunderstanding as to what may be accomplished by law. There is a wide-spread idea among the American people that nearly all human ills can be cured by legislation. That if we can persuade the State Legislature or the National Congress to fulminate against an evil, with the attribute of plenty of pains and penalties, such evils will "fold their tents like the Arabs, and as silently steal away."

But legislation has no such wonder-working power. If it had, the millennium would have been reached long before this year of grace. Instead of being a cure-all for the ills of society and state, legislation is only a palliative. It is the means whereby an intelligent and right-minded majority can compel the compliance of a recalcitrant minority.

Moreover, the passage of a law means not merely the prohibition of wrongs by wrongdoers, it implies also the sacrifice of certain rights on the part of those who would not willingly do wrong. Owing to the infirmities of human language, it is not possible to so frame an enactment that it will always and only prohibit evil acts, and not include also certain acts which may be innocent. If we make our law so general in its terms that it will never impose any hardship upon those who are innocent of evil intent, it will be so easy of evasion as to be wholly useless as a restraining measure for wrong-doing. If we make it so specific in its provisions as to entirely prevent evasion, we will find that it will also include and prohibit acts which are innocent of themselves, and thus work occasional hardship upon those who are devoid of evil intent.

We shall hardly escape the dangers of Scylla and not graze upon the rocks of Charybdis.

Accordingly, the writer has attempted to steer a middle course, and to make the draft reasonably comprehensive in its provisions, not attempting to provide for all imaginable forms of evasion, but one which will have some chance of approval by an average legislature, rather than a declaration of high ethical principles which all would admire but would have no possible chance of admission to the statute books.

1. *What Substances Should be Included in the Anti-Narcotic Law?*

Great difference of opinion exists as to what substances an anti-narcotic law should prohibit or restrict. A total of twenty-eight drugs was suggested by the replies above referred to. All admit that cocaine should be included. Nearly all would include opium and morphine. Many would include chloral, and not a few would include codeine.

But if the law stops with the mere enumeration of the preceding substances, it may be easily evaded by selling preparations of these substances. If their preparations are included, how sweeping should be the inclusion? Should preparations purporting to contain the virtues of Erythroxylon coca, as Vin Mariani, and therefore probably containing its alkaloid, be covered by the law? Should the tincture of opium be included, and catarrh stuffs containing cocaine, and proprietary preparations reputed to contain considerable quantities of chloral?

Should the law discriminate between preparations containing large and those containing small amounts? If so, where shall the line be drawn?

Is it wiser to attempt to provide in advance against every possible form of evasion, or to settle the broad principles involved, guard against flagrant abuse, and wait until evasion has become well marked and dangerous, and then broaden the law so as to cover the evasion?

The latter, it seems to me, is the more judicious plan; otherwise, by making our draft too comprehensive, we shall have one which will be difficult of enactment, or, if enacted, will become a dead letter through non-enforcement, or, if enforced, will provoke such fierce opposition as to procure its speedy repeal.

2. *Should Prescriptions Containing Narcotics be Refillable?*

If such prescriptions be refillable at the pleasure of the druggist it will practically be impossible to prevent evasion of the law to such an extent as to render it a practical nullity. If they are not permitted to be refilled except upon the written order of a physician, it will occasionally be a cause of inconvenience, but as the prime intent of the law is to make it inconvenient to procure such substances, the advantages of a prohibition upon promiscuous refilling far outweighs the disadvantages, and should certainly be included.

The draft, therefore, permits the refilling of prescriptions only upon the written order of a licensed practitioner.

3. *Should Dentists and Veterinarians be Allowed the Same Liberty in Prescribing as Regular Physicians?*

This is a question not easily answered. On the one hand, it may be argued that the dentist and veterinary surgeon have as much right to the use of the Materia Medica as has any other branch of medical practice, and that cocaine is a standard article with the dentist, and the preparations of opium with the veterinarian. On the other hand, it may be objected that prescriptions obtained from such practitioners, if the right is not restricted, would be made use of by habitues to obtain the prohibited drugs.

The practical inconvenience which might result from not extending to these special practitioners the same privileges as to regular physicians could not be very serious, because dentists can rarely have reason to prescribe cocaine for use outside of their own offices, while the bulk of veterinary prescriptions cannot be very great, and the objections to such restrictions would come rather from such practitioners than from the public.

On the whole it has been thought best to reserve to the dentist and veterinarian the right to prescribe within the lines of their respective professions, but to provide specifically that they shall not traverse these boundaries.

4. *Should Physicians be Permitted to Prescribe for Habitues?*

If they may, then unscrupulous physicians will be able to reap a harvest from such unfortunates at the expense of the reputable members of their profession.

On the other hand we are assured that habitues, especially those addicted to opium or morphine, can not be entirely deprived of their drug without great danger to their lives, and that the use of such agents may be a part of the rational treatment for the cure of the habit. Here again it is perhaps better to pursue a middle course, and to content ourselves with restricting without attempting to entirely prevent the sale of narcotics, especially opium and morphine, to those accustomed to their use. *The principal object of the law must be to prevent the creation of drug habits* rather than to reform those who are already enslaved, however desirable the latter might be, and the draft has accordingly been constructed upon this theory.

5. *Should the Sale of Proprietary Medicines Containing Narcotic Drugs be Entirely Prohibited?*

The majority of those who replied to the question said, yes. This may be ethically correct, but is it practicable? Such medicines are here, and they are widely used. They cannot be resolved out of existence, and if

we wait for them to be legislated out of existence before attempting the general restriction of the sale of narcotics our remote posterity will find the task unfinished. Will it not be wiser, then, to accept the inevitable and content ourselves with restricting what we cannot possibly hope to entirely restrain?

6. *What Should be the Penalties for Violation of the Law? And*

7. *Should Revocation of License to Practice Pharmacy or Medicine be Imposed for Persistent Violation?*

The penalties should be substantial or they will not be deterrent. They must not be too severe or they will not be imposed, and prosecutions will end in acquittal, even when the evidence is clear. The draft, therefore, provides a graduated scale of penalties, beginning with a fine of $25 and ending with a maximum of $200 and six months' imprisonment.

The preceding explanations and reasons give in broad outline the general theory upon which the draft has been constructed.

The subject is one of great inherent difficulties, greater than would be supposed, even by one who has given it much attention, until he begins the actual draughting of a regulative measure. If he attempts to recognize existing conditions, and to prepare a measure that will be acceptable to legislators, the jewel of consistency will not sparkle in his crown, and he must pursue a path as tortuous as the Labyrinth of Crete. If he follows the straight line of conscience and ethics, he will find himself the author of a measure which may be beautiful to look at, but which will have no more chance of legislative sanction than an icicle would have of continued existence in that region which is said to lie below the theological frost line.

Mr. Beal also presented a draft of a Bill to Provide Against the Evils Resulting from the Traffic in Certain Narcotic Drugs, and to Regulate the Sale Thereof.

The report just made was greeted with applause, and Mr. Hallberg moved to receive. Mr. Mayo moved as a substitute that the report be adopted, and that the Section request the Association to authorize 1,000 reprints for distribution. Mr. Beal asked Mr. Mayo to withdraw his motion for the time being, so that he might have the opportunity to offer the following motions:

1. That the form of the bill be read and considered section by section.

2. That amendments by the Section, after adoption, be referred to a special committee of three for incorporation into the model in proper form.

MR. BEAL: My reason for the latter motion is this: If we incorporate amendments to this form as we go along here, there is likely to be some inconsistency, whereas if referred to a committee, that committee can take them under careful consideration and report them back in proper form at the next session.

Mr. Mayo acquiesced in Mr. Beal's suggestion, and the Chair put the vote upon the two motions just read and they were adopted, with the understanding that the committee should report at the next session.

MR. BEAL: I would suggest that this committee be appointed now, and would ask, as a favor, that Mr. Hallberg be put on that committee.

Mr. Ebert seconded this motion.

MR. GOOD: It is not necessary to select the committee until after we get over the report.

MR. BEAL: My idea is, that if the committee is selected now it will pay particular attention to the matter.

The motion to appoint was then put and carried, and the Chair appointed on the committee Messrs. J. H. Beal, C. S. N. Hallberg and E. G. Eberle.

The draft of the bill was then read by Mr. Beal, section by section, and discussed by Messrs. Ebert, Good, Lyons, Meissner, Noll, Cliffe, Wilbert, Flemer, F. T. Gordon, Lowe, Mayo, Hallberg, Fennel, Eliel, Kremers, D. F. Jones, Claus and Beal, several amendments being proposed, some of which were adopted and others rejected, after which the whole matter was referred to the committee of three already appointed, with instructions to incorporate the amendments adopted and report the amended bill at the second session of the Section.

The Chair then called for nominations for officers of the Section, and Mr. Hallberg nominated Mr. Harry B. Mason, of Detroit, for Chairman. Mr. Good nominated Mr. W. L. Cliffe, of Philadelphia, for Secretary. Mr. Eberle nominated Mr. Frederick T. Gordon, of Washington City, for Associate on the Committee. Mr. Good nominated Mr. D. F. Jones, of South Dakota, for Associate, and Mr. Eberle nominated Mr. E. J. Kennedy, of New York, for Associate.

Upon motion of Mr. Eberle, the Section adjourned to 8 o'clock to-night.

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SECOND SESSION—FRIDAY EVENING, AUGUST 7, 1903.

The Section was called to order at 8:30 p. m. by Chairman Knox.

On motion of Mr. Lowe, the reading of the minutes of the first session was dispensed with.

The Chair announced that the election of officers for the ensuing year was the next business in order, and on motion of Mr. Eberle, the Chair was directed to cast the ballot of the Section electing the five gentlemen nominated at the close of the previous session for Chairman, Secretary and Associates, respectively. The chair stated that the ballot had been cast as directed, for Mr. Harry B. Mason, of Detroit, for Chairman; for Mr. W.

L. Cliffe, of Philadelphia, for Secretary, and for Messrs. Frederick T. Gordon, of Washington City; D. F. Jones, of South Dakota, and E. J. Kennedy, of New York, for Associates, and declared these gentlemen duly elected.

The Chair then called for the report of the Special Committee of Three on Model Anti-Narcotic Law, which was under discussion at the morning session, to which committee had been referred the proposed law, with its amendments as far as made.

Mr. Beal, chairman of the Committee, prefacing his remarks with the statement that he was unable to confer with Mr. Hallberg, of the committee, then made the following verbal report:

Mr. Chairman: The Special Committee appointed to incorporate the amendments adopted by the Section to the proposed Model Anti-Narcotic Law, report as follows:

The word "original" has been inserted in the first clause or sentence of the first section, so as to make it read, "except upon the *original* written order or prescription of a lawfully authorized practitioner," etc.

At the close of the first parrgraph of the first section—at the end of the second sentence of said section, and just before the proviso—the words, "or other lawfully authorized practitioner of medicine, dentistry or veterinary medicine," have been stricken out. This refers to the ordering of a prescription to be refilled, and leaves it so that the prescription can be refilled only on the written order of the original prescriber.

In the clause which limits the amount of narcotics which may be contained in a given quantity, the committee was instructed to amend so as to apply to solid preparations as well as fluid, and the amendment has been incorporated in the following language: "in one fluid ounce, or, if a solid preparation, in one avoirdupois ounce." This is in the first clause or sentence of the proviso-paragraph of the first section.

The committee was instructed to modify the last clause of the first section—that is, the last clause or sentence of the proviso-paragraph—so as to remove the limitation or restriction upon the sale by the druggist to the physician, dentist or veterinary physician found in the clause, not known to be addicted to the habitual, personal use of such drugs," and this was stricken out; so that, as the draft now stands, there is no prohibition on the sale to a physician, whether he be an habitual user of the drug or not.

We were also instructed to modify this same clause in such a way that there would be no restriction on the sale to colleges, hospitals, etc., and this has been done by adding to the end of the clause the words, "nor to sales to hospitals, colleges, scientific or public institutions." This comes in the list of exceptions at the end of the section.

Mr. Lowe moved that these amendments to the first section as presented by the sub-commistee be adopted, and Mr. McIntyre seconded the motion.

MR. HALLBERG: Mr. Chairman, I exceedingly regret that I was not present with the members of the Committee in making up this report. But I have listened very carefully to the reading of these amendments by the chairman of the committee, and I see nothing there that is unreasonable, and so I agree with the report as made. However, I believe we ought to include the term "derivatives"—or possibly "synthetic derivatives"—in connection with the alkaloids, morphine and cocaine. Aside from that I thoroughly approve of the report.

The motion to adopt the committee's report on the first section was then put to a vote and carried.

Mr. Beal then read section 2 of the proposed law, including the proviso at the end.

Mr. Eliel, seconded by Mr. Fennel, moved to adopt as read.

MR. FLEMER: I do not think we should attempt to say what the physician, dentist or veterinary surgeon shall do. I think this is entirely out of our field.

The Chair put the motion to adopt as read, and it prevailed.

Mr. Beal then read section 3 of the act, the penalty clause of the bill.

Mr. Eliel moved its adoption as read, which motion was seconded by Mr. Wilbert and carried.

Mr. Beal then read the fourth and final section, which, upon motion of Mr. Whelpley, was adopted as read.

The following is the complete text of the amended bill as reported by the committee:

DRAFT OF AN ANTI-NARCOTIC LAW.

A BILL to provide against the evils resulting from the traffic in certain narcotic drugs and to regulate the sale thereof.

*Be it enacted by the General Assembly of the State of* ———

SECTION 1. That it shall be unlawful for any person, firm or corporation to sell, furnish or give away any cocaine, salts of cocaine, or preparations containing any cocaine or salts of cocaine, or any morphine, salts of morphine, or preparations containing any morphine or salts of morphine, or any opium or preparations containing opium, or any chloral hydrate or preparations containing chloral hydrate, except upon the original written order or prescription of a lawfully authorized practitioner of medicine, dentistry or veterinary medicine, which order or prescription shall be dated, and shall contain the name of the person for whom prescribed, or if ordered by a practitioner of veterinary medicine shall state the kind of animal for which ordered, and shall be signed by the person giving the prescription or order. Such written order or prescription shall be permanently retained on file by the person, firm or corporation who shall compound or dispense the articles ordered or prescribed, and it shall not be recompounded or dispensed a second time except upon the written order of the original prescriber.

Provided, however, that the above provisions shall not apply to preparations containing not more than two grains of opium, or not more than one-eighth grain of morphine, or not more than two grains of chloral hydrate, or not more than one-sixteenth grain of cocaine in one fluid ounce, or if a solid preparation, in one avoirdupois ounce. Provided also that the above provisions shall not apply to preparations recommended in good faith for diarrhœa and cholera, each bottle or package of which is accompanied by specific directions for use and a caution against habitual use, nor to liniments or ointments when plainly labeled "for external use only." And provided further that the above provisions shall not apply to sales at wholesale by jobbers, wholesalers and manufacturers to retail druggists, nor to sales at retail by retail druggists to regular practitioners of medicine, dentistry or veterinary medicine, nor to sales made to manufacturers of proprietary or pharmaceutical preparations for use in the manufacture of such preparations, nor to sales to hospitals, colleges, scientific or public institutions.

SECTION 2. It shall be unlawful for any practitioner of medicine, dentistry or veterinary medicine to furnish to or to prescribe for the use of any habitual user of the same, any cocaine or morphine, or any salt or compound of cocaine or morphine, or any

preparation containing cocaine or morphine or their salts, or any opium or chloral hydrate, or any preparation containing opium or chloral hydrate. And it shall also be unlawful for any practitioner of dentistry to prescribe any of the foregoing substances for any person not under his treatment in the regular line of his profession, or for any practitioner of veterinary medicine to prescribe any of the forgoing substances for the use of any human being.

Provided, however, that the provisions of this section shall not be construed to prevent any lawfully authorized practitioner of medicine from prescribing in good faith for the use of any habitual user of narcotic drugs such substances as he may deem necessary for the treatment of such habit.

SECTION 3. Any person who shall knowingly violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and, upon conviction, for the first offense, shall be fined not less than $25 nor more than $50; and upon conviction for a second offense shall be fined not less than $50 nor more than $100; and upon conviction for a third, and all subsequent offenses, shall be fined not less than $100 nor more than $200, and shall be imprisoned in the county jail for not more than six months. It shall be the duty of the grand jury to make presentments for violations of this act.

SECTION 4. This act shall take effect and be in force from and after the ——— day of ———, 19——.

Mr. Whelpley, seconded by Mr. Ebert, then moved the adoption of the proposed law as a whole.

MR. GORDON: Mr. Chairman, I have two amendments I want to offer before the adoption of the report. The first is, wherever the words cocaine and its salts and morphine and its salts occur there shall be inserted, "and the synthetic derivatives thereof." My reason for urging this amendment is this: In the work I have done on the Committee on Drug Habit I have found that there are a great many people who use drugs that will resort to any means to get them, and there are a great many people who supply them who will take advantage of any loophole to do it. Therefore, I think we should leave no loophole. I know a case where a man is advocating the use of heroin tablets to morphine users, saying it has the same effect as morphine. I think any loophole for any substitute for these salts will defeat the entire bill.

Mr. Eberle seconded the motion to so amend.

MR. KREMERS: I hope this preposed amendment will not carry. As I said this morning, we may succeed in making this law ridiculous, and we certainly do not want to do that; we cannot afford to do it.

MR. EBERT: Let us vote it down; it is the right thing to do.

MR. KREMERS: If that is the case—if we are to do that—I have nothing more to say of course.

The Chair then put the motion of Mr. Gordon, and it was apparently lost, on an aye-and-no vote, but a division was called for by Mr. Hallberg.

MR. STURMER: I think it would be better if the qualifying adjective "narcotic"—*narcotic* derivatives—were put in there.

There were calls of "Question!" and the Chair called for a rising vote upon Mr. Gordon's motion, with the result that the motion was lost.

MR. GORDON: Now I have another amendment I want to offer, to provide some penalty for the deliberate or wilful teaching of another person the drug habit.

THE CHAIRMAN: That would seem to be out of order. The motion before the house is, to adopt the law as a whole.

MR. BEAL: I would like to move to amend that motion so as to say *provisionally* adopt. Then, after the vote is taken, I want to make another motion.

Mr. Whelpley said he would accept the amendment to his motion to adopt, and the Chair put the motion to provisionally adopt and it carried.

MR. BEAL: On account of the great importance of this subject—which is more far-reaching than we imagine—and the importance of the proposition that when we do adopt this law it shall be one that shall be entitled to the respect and confidence of pharmacists and physicians everywhere, I would like to move, first, that the incoming Chairman appoint a committee of three on anti-narcotic law—on a form of anti-narcotic law; second, that this form of law as provisionally adopted be sent to the various pharmaceutical journals, with request that they publish it, together with editorial criticism and suggestions, and calling for suggestions and criticism from the pharmaceutical public at large; third, that they send marked copies of their journals containing these suggestions and criticisms to the committee on model anti-narcotic law, and that this committee shall take these into consideration and report this form as they may amend it at the meeting at Kansas City in 1904. The motion is long, but I do not see how it can be well shortened.

The motion was seconded by Mr. Eberle and carried.

MR. HALLBERG: I would suggest that in addition to that this committee send copies of this draft of law to a few of the leading larger dailies in the country, such as the "New York Times" and others that do not accept objectionable medical advertisements. They might be interested in this subject and be glad to have a copy of it. I offer that as a suggestion.

THE CHAIRMAN: The new chairman has heard it, and will probably act upon it.

The Chair stated that the next order of business was the reading of papers, and said the first on the list was one by Mr. Whelpley, of St. Louis, upon the subject of "A Conference of Board of Pharmacy Members."

Mr. Whelpley then read the paper as follows, calling particular attention to the motion made at the end of it, which motion was seconded by Mr. Teeters, of Iowa.

## A CONFERENCE OF BOARD OF PHARMACY MEMBERS.

BY H. M. WHELPLEY, PH. G., ST. LOUIS.

Our state and provincial pharmacy laws and boards of pharmacy have gradually grown in number until now it is practically true that no one can engage in the drug business in the United States or Canada without the authority and consent of a board of pharmacy.

This is very well and good, but some of these boards have democratic powers which work an outrage upon the pharmacist who desires to leave

one state or province and take up his home and follow his occupation within the jurisdition of another board.

A man or woman who is competent to conduct a drug business in Missouri loses no pharmaceutical skill, moral character or business judgment when crossing the state lines. But the Michigan and several other laws take quite a different view of the case. The Michigan Board of Pharmacy says, "You may be a Missouri pharmacist and legally competent to compound prescriptions for Missourians, but we must determine whether you are sufficiently skilled to be trusted with the lives of Michigan wolverines before you sell five cents' worth of paragoric in this state."

This condition of affairs costs the pharmacists of America many thousands of dollars every year, to say nothing about the loss of time and inconvenience and mental anguish borne by those registered pharmacists of one state or province who take an examination in order to practice in another jurisdiction.

The remedy is within the hands of this section of the American Pharmaceutical Association. Will you act now or wait until the ridiculous outrage has run rampant for a few years more?

We now have a model pharmacy law, and a standing committee on model pharmacy law. Let us follow up this line of work by securing as members of the A. Ph. A. all of the members of boards of pharmacy. But even before this is accomplished we can form within the Section on Education and Legislation "A Conference of Board of Pharmacy Members." We can arrange for an open session of the conference in this section of the A. Ph. A. during our 1904 meeting.

Board of Pharmacy members are almost without exception influential in their state or provincial legislative affairs. They can co-operate with the committee on legislation of state and local pharmaceutical associations and in a few years accomplish much desired changes in the pharmacy laws.

Now, Mr. Chairman, in order to keep my suggestion properly before the Section, I move that this paper be accepted for publication and that the chair be requested to appoint a committee of five board of pharmacy members, this committee to call a conference of the various board of pharmacy members present this year and, with the new officers of this Section, arrange for a special session of board members at our 1904 meeting of the Section on Pharmaceutical Education and Legislation.

MR. WHELPLEY: Mr. Chairman, speaking to the motion made in my paper I will say, that the Conference of Pharmaceutical Teaching Faculties has taken action somewhat similar to this. They have instructed their secretary to communicate with all members of Boards of Pharmacy in the United States and invite them to meet with the Conference at Kansas City in 1904. If we now carry out the motion as suggested, the members of the Boards of Pharmacy will receive a double invitation, one from this organization and the other from that conference, to be present at our 1904 meeting. If we get a fair representation—and I am confident we will—the work will take care of itself. I must remind you that, during the dozen or more years last past, a number of attempts have

been made to organize the representatives of the Boards of Pharmacy. These have failed for various reasons, the principal one of which is, perhaps, that the members have been so interested in the various Section-meetings and the different classes of work going on in the Association that they could not find time for a conference that would meet with the convenience of the different members. But if we should set apart a fixed time in the programme of our 1904 meeting—even though it be but a short time—so that they can get together without interfering with any other work, I am sure that good results will follow.

MR. MASON: It seems to me that provision ought to be made for this conference outside of the Section on Education and Legislation, for this reason, that the time of the Section is already very limited. Would it not be better to have this matter disposed of by the Council, somewhat in the manner that Mr. Kremer's Historical Committee was provided for this year, and not rob the time of the Educational Section, which is already too limited?

MR. WHELPLEY: The conference of the members of Boards of Pharmacy need take up but a few moments of the time of the Section itself—just sufficient time to give them official standing and to bring them together. Then by motion we can refer the conference to a special time to be arranged by the Council. My idea is to give them an official standing first. This official standing was given the Committee on Historical Pharmacy by the Association itself, at the 1902 meeting. This is one reason why we have had such a successful session of that committee.

MR. MASON: Would Mr. Whelpley approve an amendment to his motion to the effect that the Council recognize the conference, as it has recognized the work of the Historical Committee, and set apart a special time for the meeting? or does Mr. Whelpley contemplate that no actual time will be taken up, so far as this Section is concerned?

MR. WHELPLEY: Perhaps not, at our next meeting. Let us see the result of this motion, and if the results are as anticipated, the rest will take care of itself.

Mr. Whelpley's motion was then put to a vote and carried.

Mr. Hallberg then read the following paper, receiving the applause of the audience.

## "HIGH CLASS DRUGGISTS," OR THE PRIVILEGE AND DUTY OF THE PHARMACIST.

BY C. S. N. HALLBERG, PH.G.

Complaints are constantly heard during recent years that the pharmacist is not as respected by the public as formerly; that he is not to be depended upon; that he must be watched, or he will "palm off" some worthless medicine or substitute on his patrons.

Ever since the famous "substitute" onslaught, some twelve years ago by that puissant advertising agent, Richardson, this has been the slogan of the patent medicine advertisers. Even some of the respectable manufacturers of proprietary pharmaceuticals have resorted to this method of exploitation often to the extent of conducting a megaphone department in the guise of a detective bureau. The result might have been anticipated. Every newspaper worm looks upon the average druggist as a robber;

comes into the store, after having used it as a door-mat for a whole season, to purchase some article, and leeringly insinuates that he usually buys the article at some large establishment or wholesale house where he "is sure to get what is called for." Should the druggist protest that he also gives "what is called for," he is usually treated to a dissertation on drugs and medicines in general, intended to show what an ignoramus said druggist really is, and what an encyclopedia of medicine and "hot air" is this "smart Aleck."

Recently there has appeared in the principal newspapers throughout the country an advertisement headed: "High Class Druggists and — Others," part of which reads as follows:

> The better class of druggists, every where are men of scientific attainments and high integrity, who devote their lives to the welfare of their fellow men in supplying the best of remedies and purest medicinal agents of known value, in accordance with physicians' prescriptions and scientific formula. Druggists of the better class manufacture many excellent remedies, but always under original or officinal names, and they never sell false brands, or imitation medicines. They are the men to deal with when in need of anything in their line, which usually includes all standard remedies and corresponding adjuncts of a first-class pharmacy, and the finest and best of toilet articles and preparations and many useful accessories and remedial appliances. The earning of a fair living, with the satisfaction which arises from a knowledge of the benefits conferred upon their patrons and assistance to the medical profession, is usually their greatest reward for long years of study and many hours of daily toil. They all know that——— is an excellent laxative remedy, and that it gives universal satisfaction, and therefore they are selling many millions of bottles annually to the well-informed purchasers of the choicest remedies, and they always take pleasure in handing out the genuine article. * * *
>
> Owing to the excellence of ———, the universal satisfaction which it gives, and the immense demand for it, imitations have been made, tried and condemned, but there are individual druggists to be found, here and there, who do not maintain the dignity and principles of the profession and whose greed gets the better of their judgmnnt, and who do not hesitate to recommend and try to sell the imitations in order to make a larger profit. * * * In order to sell the imitations they find it necessary to resort to misrepresentation or deception, and whenever a dealer passes off on a customer a preparation under the name———he is attempting to deceive and mislead the patron who has been so unfortunate as to enter his establishment, whether it be large or small, for if the dealer resorts to misrepresentation and deception in one case, he will do so with other medicinal agents, and in the filling of physicians' prescriptions, and should be avoided by every one who values health and happiness.

This skillfully-worded advertisement serves excellently to educate the public to the belief that only such druggists who obediently sell anything that is called for are "High-Class Druggists," while "there are individual druggists to be found here and there who do not maintain the dignity and principles of the profession," etc., who find it necessary "to resort to misrepresentation or deception;" that is, who may recommend or sell an imitation, a preparation of some other make or brand, and such druggists "should be avoided by every one who values health and happiness."

### THE PREROGATIVE OF TRADE.

Here we have at last a definition of what constitutes not only a "High-Class Druggist," but also "that to maintain the dignity and principles of the profession" a druggist must sell a syrup of senna when syrup of figs is called for; he must become a "substitutor;" he must sell a preparation made after a purported formula; he must come down to a level below that of the grocer who feels perfectly free to prevail on his patron to accept, for example, "Tryabita," even when the smile of Sunny Jim had "Forced" him to ask for that other famous breakfast food. To be forced into a commercial position lower than that of a grocer in order to attain the distinction of being called a "High-Class Druggist" is certainly hard, but when in the same breath we are told that only such uphold professional dignity and principles, then indeed we feel like "speaking softly, but carrying a stout stick."

### THE PHARMACEUTICAL PRIVILEGE.

In order to uphold professional dignity and principles a pharmacist should be responsible for what he sells. Under the law he is responsible for the identity, purity, quality and potency of drugs, chemicals and medicines. Preparations of well known composition it is not only his privilege, but his duty, to make of the best quality of material after the most authoritative formula, or to buy the very best on the market. In the latter instance it is his duty to ascertain, when possible, if the article responds to the requirements, or, lacking this, to procure the most celebrated brand of manufacture. The article referred to, while a proprietary medicine, is not objectionable *per se*. Its composition is not secret, although the formula as published is inaccurate. It is not original, since if any one should be credited with the proper extraction of senna it is Dr. Hermann Hager, the great German pharmacist.

### THE PHARMACIST'S DUTY.

Since these preparations are not original and not secret, the advertisers should confine their statements to such facts as would be calculated to influence the public to prefer their make. If their arguments for preference are not always convincing, but enable a skillful pharmacist to secure favor for his manufacture, it should be remembered that such is the unavoidable fate of contest. To offer his own make when it is of commercial advantage is not only the pharmacist's privilege, but also his duty. The *preparation* of medicines is as much a function of the pharmacist as is compounding and dispensing. If the art of preparation be delegated, it must be substituted by the fundamental functions of identification and valuation by the dispensing pharmacist.

### THE PHARMACIST'S BIRTHRIGHT.

While unfortunately the pharmacist has but little responsibility in the

sale of patent medicines, still he must assume such to a certain extent. He can never afford to renounce his prerogative as a manufacturer of medicine. He cannot "sell his birthright for a mess of pottage," the privilege of becoming a simple seller of medicines; it is this tendency which has brought so many druggists "dans le potage."

PROTEST AGAINST DEGENERATE ADVERTISING.

But whatever difference of opinion there may be as to the commercial advantage derivable from one position or the other on this question in the present status of the retail drug business, the position of the American Pharmaceutical Association on this question of degenerate advertising should be unequivocal.

For months glaring posters of a certain mineral water have been displayed bearing the legend:

"Patronize drug stores where you get what you want for self-protection."

Also an advertisement for the same water:

"Don't be tricked by unscrupulous druggists with worthless substitutes."

Such tactics should not be tolerated. What can be expected from the public with such scurrilous innuendos constantly confronting it? How can we expect druggists to be respected who sell the articles advertised in this "stop-thief" manner? How can pharmacists be regarded as professional men unless they resent such unscrupulous methods of degenerate patent medicine advertisers? Let us remember the advice of the chief executive, "Learn not to hit, but if you must hit, hit hard."

*Chicago College of Pharmacy, July 10, 1903.*

The Chair stated that, without objection, the paper would take the usual course.

Mr. Sayre read his paper in abstract, eliciting the applause of his audience, the full text of the paper being as follows:

## PLANT ANALYSIS AS A PART OF A PHARMACY COURSE.

BY L. E. SAYRE.

At the last meeting of this Association the writer endeavored to bring forward, in this Section, the importance of pharmaceutical testing as a part of the college curriculum (See Proc., 1902, p. 639). It is now proposed to present the claim of a closely allied subject, that of plant analysis—the analysis of plant constituents.

We are aware that many of our colleges and schools give excellent courses in this subject, and it is needless to urge on them the value and importance of the course as a factor in pharmaceutical training. But, unfortunately, there are schools, instructors and students to whom the subject does not appeal, other than as one worthy of the attention of the professor or analyst, but not worthy of the valuable time of the practical pharmacist.

What we mean by the course mentioned is best shown, perhaps, by giving an example of what is actually accomplished by students in some of our colleges and schools—some in ten weeks (two hours each day), others in more or less time.

A crude drug, of unknown composition, is taken, and the following estimations are made:

I. Moisture, in fresh or air-dry drugs.

II. Ash. Also, qualitative determination of inorganic constituents—acids and bases—in the ash.

III. Alkaloidal content. It may be remarked, in passing, that we have found it best to select, for drill, a drug of well-defined alkaloidal constituent, the student using, for its estimation, three or four well-known processes for comparison.

IV. Ethereal extractives. By the use of various ethereal solvents, in continuous extractor, and further separation of these extractives, such proximate constituents are obtained as:

Volatile oil.

Fixed oil.

Resin, wax, etc.

V. Alcoholic extractives. The dregs, left from the ethereal treatment, yield to alcohol such principles as:

Vegetable acids.

Saccharine matter, etc.

VI. Aqueous extractives. By extracting the dregs from the alcoholic treatment the following are separately determined:

Albumenoid matter.

Starch and its allies, etc.

VII. Acid and alkaline extractives. These are separately examined and reported upon, and finally the cellulose constituent of the drug is left and quantitatively estimated.

This outline is exceedingly brief, of course. If more detail as to what is done in ten weeks is desired, we would refer to an article published in the "Druggists' Circular," 1903, p. 26.

During the course the student is required to consult such works as Prescott's Organic Analysis; Allen's Commercial Organic Analysis, Vol. I., 3d Ed.; Sadtler and Coblentz Pharmaceutical Chemistry; Lyons' Assay of Drugs, and special articles on the subject in pharmaceutical periodicals.

We wish to make a plea for such a course in all of our teaching colleges for the following reasons:

1st. For its practical value as a mechanical training, developing a skill in the use of certain kinds of apparatus.

2d. Because it brings into requisition the thinking powers and encourages originality in a special manner.

3d. Because of the training in processes that require exactness and skill, and because of the mathematical drill in working percentages of various constituents. It is surprising how many students need this drill, simple as it is.

4th. Because it widens and makes more comprehensive the view of plant principles, such as simple reading and class-room study cannot give.

5th. Because it stimulates original research and brings the student in closer touch with pharmaceutical work so essential to progress in his chosen profession.

6th. It is the best course we have to call into use and make practical application of nearly all the principles the student is taught during his scientific course. It also gives the instructor one of the best opportunities for estimating the capacity of the student.

If the results of this work be expressed, as they should be, on paper in logical order and in good English here is another important element not to be overlooked. The deductions, from data obtained, put in good English, furnish a training of which our students cannot have too much.

We frequently have the objection to meet that such studies as plant analysis are not essential to the practice of pharmacy—not necessary for the *business* of pharmacy. No one is more familiar than the instructor with the arguments raised against unpractical training. While we would go beyond the scope of this paper were we to take up this point, we should like to add that the question of practicality has been raised with a great many studies—now admitted of great utility. Qualitative and quantitative analysis, urinalysis, bacteriology, but all these have borne fruit for the practical pharmacists, even looking at it from the money-getting point of view. A very practical side to pharmacy, and a very serious one, is that which relates to scientific work. If we are able to maintain the business side of pharmacy as it should be, we must continue to have scientific workers, those who have training to meet emergencies and demands such as the new Pharmacopœia will present. We should have these widely and plentifully distributed. To an instructor it is almost pathetic to see and realize that so many licentiates in pharmacy are kept in ignorance of their ignorance of the real demands of the profession to which they belong. The ideal drug clerk is one who has business tact and scientific skill. The former should be born in him. The college may do something to develop it, but the drug counter is the place where it grows naturally. The scientific skill the college should look after, for the perfection of the otherwise one-sided pharmacist.

The Chair invited remarks on the paper just presented, but none were offered, and the Chair stated that the paper would take the usual course, without objection.

The Chair then named the following as the committee of five authorized to be appointed on Board of Pharmacy Conference: George Reimann

(Chairman), of New York; Geo. W. Voss, of Ohio; W. L. Cliffe, of Pennsylvania; D. F. Jones, of South Dakota, and Fletcher Howard, of Iowa. The Chair suggested that the committee get together as soon as possible and formulate their plan of action, as the time was so nearly over that prompt action was required if any good was to come from the motion.

THE CHAIRMAN: Next on the program we have two papers that really do not belong to this Section, but they are papers of interest bearing on the welfare of the Association and I think it is important that we should listen to them, so I have given them a place in the list of Section papers, and will first call on Mr. Gable to read a paper he has prepared, entitled "From Strength to Strength."

Mr. Gable said he would not read the paper except by title, but for the fact that it was a subject that had not been touched on at this meeting—the welfare of the Association; that no like paper had been read at this meeting. He then presented his subject as follows, being applauded upon his effort:

## FROM STRENGTH TO STRENGTH.

BY RALPH B. GABLE.

I am going to take as my text part of the nineteenth recommendation of President Whelpley in his address last year; the words are, "Increase membership by business methods."

My subject is somewhat hackneyed, I know, and when I started to write, my prefatory sentences were apologetic. I laid them aside and started anew. "Why," I reflected, "should I apologize for saying something more on a topic which lies close to all our hearts? Why should I hesitate when I have in mind the ulterior benefit of many pharmacists?" So enthusiasm has supplanted diffidence, and I come before you to suggest that Prof. Whelpley's recommendation be modified so as to read, "Increase membership by advertising."

When my cells of ideation had evolved the dominant thought of this paper I took it and laid it before a friend whose interest in affairs pharmaceutical goes back a great many years. He listened to me gravely. "Luminous thought," he finally said; and then continued in an unnecessarily dispassionate tone, "The American Pharmaceutical Association has been advertised more than any other scientific organization that I ever heard of." "Professor," I protested, "this is like a plunge in ice water." "I can't help it," he rejoined. "I can produce documentary evidence if you care for it. Go over the files of the various pharmaceutical journals. Every year and in every journal you'll find editorials full of advice and admonitions about the A. Ph. A. The pharmaceutical press has always been a valuable ally of the Association. Columns upon columns have been written. I verily believe that the sum total of the number of words that have been written would make a volume as big as Webster's Unabridged."

"Very true," I assented: "your speculations might be interesting if they were not so pessimistic in trend. But let me remind you of one phase of all the editorials that you so feelingly mention. From the very nature of things they had to deal in generalities. They were intended to inspire readers with higher ideals and aims. They were supposed to instil into the minds of pharmacists more love for their profession and a feeling of pride in and loyalty to the representative organization of their profession. Getting down to the essence, to the soul of the matter, the readers of those editorials imagined they were adjured to be more scientific and to evince their devotion to science by becoming members of the American Pharmaceutical Association. This reminds me of a scene in a musical comedy that I enjoyed some time ago. One of the characters because of violating a law of the Flowery Kingdom, is condemned by the emperor to be fried on the official frying pan. 'But I don't want to be fried,' he wildly protests, 'I want to be just as I am.' And so, my dear Professor, I feel confident that the average pharmacist says to himself, 'But I don't want to be *only* scientific; I want to make money.' What is more, it is a melancholy fact that a large number of pharmacists read very few editorials. I think now I have disposed of your opinion so confidently announced a few minutes ago, that the American Pharmaceutical Association is the most widely advertised of all scientific organizations. Having reached that point I want to tell you what ideas I have for advertising it."

"You, of course, fully realize what a wealth of information, and what a valuable and comprehensive record of current progress the annual Proceedings comprise. Thousands of pharmacists do not have the faintest conception of the value of this volume; of the potentialities that lie within its covers. My idea is that the Proceedings should be the theme of our advertising. We should show the advantages of Association membership in a concrete way by touching the Proceedings with the wand of the imagination. In other words, we should open the eyes of the unbelieving."

My friend for some moments had been visibly restless, and he here broke in with "Well, let's know about this wand of the imagination. What are you going to do, and how do you propose to go about it?"

I gave no heed to the trace of impatience as I said, "I would have the Auxiliary Committee on Membership get up a series of special mail cards. This series should consist of three cards, and each one should present one or two particularly strong features of the forthcoming volume of the Proceedings. This is what I meant a moment ago by the 'wand of the imagination.' Don't confuse the word 'imagination' with 'exaggeration,' for imagination, as I take it, is only getting at the truth that lies beneath the surface. To apply imagination to the pages of the Proceedings is to show by the methods of an advocate, a counsellor, that the work possesses a definite value as a mentor, a reference work, a solver of problems in daily duties." At this juncture the professor offered me a cigar; I

accepted it as a sign of interest. The cigar was better than the professor usually smokes, but I didn't stop to discuss that point. "These cards," I continued, "I would mail to 1000 pharmacists. They will cost about $7.50 a thousand; the postage will cost $10.00; to address them will cost $2.00; total in round figures $20.00, and the cost for the series of three cards will be $60.00. A good size for the cards would be 4¼ in. wide, 7 in. long. This size is large enough to carry a comprehensive message, yet not so large as to be broken in the mails.

"I speak of three cards because I am a firm believer in cumulative effects. I don't think much can be accomplished by one advertisement. It is continuity of effort that counts in anything. I would mail these cards at intervals of four weeks. I would select the names for the list of one thousand from towns and cities located within 250 miles of the meeting place appointed for the following year. I would not address any of the druggists in the city where the next sessions are to be held. I would make it understood that each recipient of a card could become possessor of the forthcoming Proceedings by remitting $5.00 in conjunction with an application for membership. I have sufficient confidence in the wonderful scope of the Proceedings to believe that such a campaign would produce results."

At this point the professor averted his eyes and began to shake his head, as if vexed by some disturbing thought. "But what," he said, emerging from his reflections, "have you to say about the yearly loss of members. What is the use of trying to enlarge your membership if you can't hold the old ones?" "But we can," I said. "We can try to hold them in line by using the same general plan. If the Treasurer's vision is not gladdened by the sight of a remittance from a member at the end of two years, it should be accepted as circumstantial evidence that the member is likely to slip away if we 'don't watch out,' as Riley phrases it. Then he, and other members in the same category, should be remembered in a series of 'invitation cards' to be issued in the summer prior to the next annual meeting. I'll say a little more about those cards later on. Tut, tut! I see by the way you look that you imagine these cards will be diplomatic duns, but that isn't so. Enthusiasm in any cause, you know, may flag at times. It is so in politics, in religion, in fraternal societies, in life insurance. And the same condition is prone to occur in Association life. The cards I propose are calculated to cause the recreant ones to rally once more around the standard of the Association. If we can frame several messages strong enough to win new members, I see no reason why we cannot find ways to displace apathy and put in its stead genuine and abiding interest with those who have been with us for a time."

"Well, the scheme sounds quite plausible, I must say," observed the professor.

"Plausible!" I echoed. "I never did like the flavor of that word. But

I won't dispute about your rhetoric so long as I have your interest. One more feature of my general plan I should like to outline and then I'll leave you. The following summer, as the time for the annual meeting approaches, the Auxiliary Committee on Membership should inaugurate a campaign for members among another thousand pharmacists in the territory contiguous to the place of meeting. A second list of a thousand names should be arranged in which, if possible, none of the pharmacists in question would be located more than 250 miles from the convention hall. Six weeks from the date of the meeting the first card should be mailed. It, as well as the two remaining cards of the series, should be written so as to emphasize in the strongest manner possible the benefits of association membership. The purpose of the various Sections and the value of their work to the busy, practical pharmacist should be touched on, and the recipient made to feel that if he attends the meeting he will be put into possession of ideas which can be turned into coin; that knowledge will be gleaned which will tend to professional growth; that he who meets with us will receive inspiration and mental refreshment which will lend renewed vigor to his —— "

"But that isn't logical," broke in the professor. "You found fault awhile ago with editorials because they dealt so largely in generalities, and now you're proposing to do pretty much the same thing."

"Not exactly, my dear professor. The cards I have in mind would be advertisements in truth. Some definite facts, some specific points could be employed; enough, I am sure, to induce some of those thousand pharmacists to become members. The first card, as I said, should be mailed six weeks from the date of meeting; the second two weeks later; the third two weeks from the time of meeting. Thus every one of the thousand would receive three reminders of the Association; three invitations to join us."

"One more point. When a man meets with us for the first time he should be made to feel that we are glad to see him. We should show some warmth of regard for him and see that he meets a goodly number of members. The week of the meeting is a very busy one for a great many of those who are regular attendants. Their time is largely occupied with official duties, or, if they are not busy with duties pertaining directly to one or more of the Sections, they have their old circles of friends to greet. But there are always some genial souls who could act as social sponsors for new members."

"Without a doubt, without a doubt," interjected my friend. "In years past I have asked a number of men why they have dropped out of the Association, and after various evasive answers the real reason would be developed; they had foolishly allowed themselves to feel slighted because they became acquainted with so very few fellow members. The time at the meeting, outside of sessions, hung rather heavily on their hands. So I

am in hearty sympathy with your idea of delegating the care of new members to a definite committee."

"Now, I've told you my whole story, professor. Don't criticize just now. Think about it for some time and let me hear from you."

I kept out of his way after that. At length I received a note from him. This is what he said: "If I had your enthusiasm on the subject of increasing membership, I think I'd try to write a paper on it."

I have followed his advice.

*15 University Place, New York*

MR. LOWE: I move that this paper take the regular course, and in addition that it be referred to the Chairman of the Committee on Membership—or to the Auxiliary Committee on Membership, whatever you choose to call it. In addition to that I would like to say (as the Treasurer is absent and cannot say it for himself) that I think our Treasurer pursues about the same course that has been indicated in this paper. He sends out to non-payers of their dues four postal cards, with an interval of about two months between them.

Mr. Boring seconded the motion to refer.

THE CHAIRMAN: The motion is, to refer to the *General* Committee on Membership, as I believe it is now called?

MR. NOLL: I think it would be a good idea to have a committee regularly appointed —and possibly wearing badges—to look after new members coming to the Association meetings, and make them feel at home; and I think every member should constitute himself a committee of one to extend the right-hand of fellowship to his neighbor on his right and left, like they do in religious meetings.

MR. EBERT: I would like to say something in regard to that point. I believe we often miss keeping our new members when they come to the Association meetings for the first time, and go away feeling neglected. In my experience I have many a time had some member say to me, "The first time I came to the Association I was treated well, and I took an interest in it;" and I believe that is what we ought to do, make these new members feel welcome and at home with us. If the Committee on Membership, which makes such an effort to get new members, would do something to bring them forward and get them interested in the first meeting, I think it would do a good work.

The motion to receive the paper and refer as indicated was then put and carried.

MR. MAYO: *Apropos* of this question that has been raised here, would it be out of place to suggest that, since we have introduced matter extraneous to this Section, we provide for the appointment of a committee to consider this question? or shall we instruct the Committee on Membership to act as a committee on reception? They are so situated as to be best fitted to act as such. I move that the Section recommend that the name of the General Committee on Membership be changed to General Committee on Membership and Reception of New Members. That would have to go to the general session, of course.

Mr. Teeters seconded the motion.

MR. WOOTEN: I should like to ask how many members this committee consists of?

THE CHAIRMAN: It consists of about seventy members. I had about seventy on my committee, I know.

MR. MAYO: The reason I suggest that is, that all applications for membership pass through the hands of this committee; consequently, each member through whose hands an application passes would feel it incumbent on himself to introduce the new member whose application he had handled.

MR. WOOTEN: The plan is an excellent one, but it seems to me it is rather unwieldy. A committee composed of seventy persons would be unwieldy. It would be everybody's business, and consequently nobody's business. I do not object to the idea, but I do not see how it is practical to work it successfully unless there should be a sub-committee to attend to the reception of new members.

MR. MAYO: As a matter of fact there are generally about ten members of that committee present at the annual meetings.

Mr. Mayo's motion as to change of name of the committee was then put and carried.

At request of the Chair Mr. Gordon then read the following paper, upon which he was applauded:

## SUGGESTIONS FOR INCREASING THE MEMBERSHIP AND THE INFLUENCE OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

FREDERICK T. GORDON, U. S. NAVY.

The following suggestions are respectfully offered for the consideration of those present at this meeting, not with any thought that they are solutions of the problem above stated, but with the hope that from them and their discussion *some* good effect may come. With every friend of the American Pharmaceutical Association the writer hopes for the day when the Association will occupy the position and have the prestige and power that its name implies, when it will be a real power in things pertaining to pharmacy in this country, shaping and controlling legislation affecting pharmacy, influencing the educational standards of recruits to our ranks, and having the right and ability to represent us in all vital matters. But before we can do more than hope for such a consummation we must have *enough* members of the right sort in *every* section and locality to make the Association a live issue in their sphere, members everywhere who will keep before their fellow pharmacists a realization that such a body as a national association of pharmacists exists.

The great weakness of the American Pharmaceutical association, and also the greatest danger to its perpetuation, comes from the ignorance of pharmacists of the real meaning and work of the American Pharmaceutical Association and the lack of any local activity to keep up the interest of members once secured. It is not that the right kind of men do not want to join the Association, nor that once members they are satisfied with simply keeping their names on its roll; they do not see anything tangible

coming from the Association, and therefore look upon it as merely an academic question of no interest to them. It is pretty hard to interest men by telling them of the benefits of an association that never has met, and probably never will meet, near enough for them to attend a meeting, and whose meetings occur but once a year, of whose doings they learn only casually from the brief reports of the drug journals; whose members are known to them only by name; and whose only way of reaching its members is by a book published at yearly intervals. The average druggist has the idea that the American Pharmaceutical Association is a sort of close corporation composed of "college professors and scientific fellows," and that its doings have not the slightest practical bearing on his interests, and really when we come down to actual facts this ignorance is not so hard to understand. We meet but once a year, for a few days, and even at that, few of us have the time or the means to attend these meetings; the rest of the year we practically have nothing to remind us of the existence of the Association save an occasional circular letter from one of its committees. We must do *something* to change this state of affairs if we would prosper, something to bring home to every worthy member in the ranks of pharmacy, in all its varied branches, realization that such a thing as the American Pharmaceutical Association is in existence, and that he can obtain great and practical benefits from it if he will only do his part in the work; *something*, too, that will keep up interest by frequent exhibitions of activity lest he forget it altogether.

Such a "something" has long been successfully done by a sister scientific organization—the American Chemical Society—and the results in gaining widespread membership, and in maintaining the interest and active participation of those members, certainly seem to give us reason for believing that a similar effect would follow *our* adoption of the same policy. The plan for carrying out such a scheme of action is briefly outlined in a general way—details could be worked out as best seems feasible.

Apportion the members of the Association into groups, divided according to their geographic location, making each group contain the members of a territory small enough to permit their frequent assembling without much travel or expense. In thickly populated parts of the country groups could be formed of the members in large cities and the nearby towns, in sparsely-settled districts either wait for sufficient membership to be secured or take as a center the town holding the greatest number of members. Call these groups "Sections" ("of the American Pharmaceutical Association"), named according to location—as "New York Section," "Chicago Section," etc. Give each section the organization usual to scientific societies—President, Secretary, committees, etc., with the President of each section also holding during his term of office the position of Vice-President of the A. Ph. A. Have these officers elected by the local sections about the time of the annual election of officers of the parent association, so that

the two would hold office coterminously. Each section would be in charge of the interests and matters affecting the A. Ph. A. in its territory, its President would be the direct representative of the Association in his locality, it would be the Section's duty to work actively to secure members from the pharmacists in its jurisdiction and on its recommendation local members would be admitted into the Association. The only qualifications for membership in the local sections would be active membership in the parent Association, and all members of the Association would be, of right, members of sections. There should be no dues collected, except the collection of entrance fee and dues of local members for forwarding to the Treasurer of the Association. The Secretary of each section might be allowed a nominal salary in payment for his work. The expenses of the sections—in holding meetings, sending out notices, etc., should be borne from the general treasury, such expenses to be specifically allowed in our Constitution and be audited with other disbursements of the Association. So much for a tentative proposition for organization, now for the real "raison d'etre" of these local bodies.

Sections should hold meetings at least once a month, except possibly during the summer months. At these meetings papers on pharmaceutical topics could be read and discussed, addresses secured from prominent pharmacists or notabilities of any kind, matters of local interest, either professional or affecting local conditions could be brought up and talked over —in fact, anything that was within the sphere of pharmacy could be made the feature of a meeting—or of some part of it. In addition, provide for frequent social meetings, such as a dinner at some hotel at a cost of fifty cents or a dollar a plate, a "smoker," lectures, etc., anything to bring members together. This is the vital, essential feature of the idea, the providing of some means for causing tangible manifestations of the existence of the Association often enough to keep up interest in members and to arouse interest in observers, in short, making the Association a real factor in the pharmaceutical life of every locality.

Even if the monthly meetings were not so largely attended, the fact that such an organization as the local sections existed would constantly bring before druggists the fact that there was an American Pharmaceutical Association somewhere around. Such a body, too, would provide a nucleus around which local pharmaceutical interests could crystallize in time of stress, that could be used as a rallying point for wider organization to defeat legislation menacing the drug trade or to secure laws to foster its interests and standing, for correcting local abuses, as a means for establishing closer relations with the members of the medical profession in that territory—indeed, the possible field of activity is too wide to even more than hint at. The additional expense of such sections would be amply compensated for by the benefits to be secured, although the likely increase in membership and the holding of old members would more than return the outlay.

The field of activity of these local sections would in no way affect or conflict with the State Pharmaceutical Associations nor with local associations of the N. A. R. D.—The work of the sections would only be a duplication of the work of the parent Association, with the only difference of more frequent meetings and a concentration of interests on a smaller number of issues and of a more local interest. Of course all the details are merely incidental—take the essential idea of establishing small, compact local branches of the American Pharmaceutical Association and providing for frequent meetings by arranging the sections to cover a small easily travelled territory, and arrange the working details in any manner. I have seen such good results in the way of increased membership, active interest and participation in the work of the parent society, valuable papers and contributions made to science generally, etc., etc., together with a closer personal acquaintance and better fellowship among members, come from this Local Section Plan as followed by the American Chemical Society that I am very sanguine that it will do as well for us. As a further suggestion, it might be provided that important papers read at meetings of local sections could be again presented at the annual meeting following of the Association, and if not too costly, published in our Proceedings.

The second suggestion I have to offer is less pretentious than the foregoing, and its adoption and putting into effect will require little, if any, change in our by-laws. It is this: Establish a number of "honorary memberships" to be awarded each year, each membership carrying with it remission of dues for one year, equal in number to the reputable colleges of pharmacy in the United States and Canada, and award these free memberships thus: Let the Association give notice to each college of pharmacy, in any suitable manner, that the American Pharmaceutical Association offers as a prize for the best paper on some original work submitted by members of that year's graduating class membership in the Association with the first year's dues free, and issue invitations to the graduating students to compete for the award. The only restrictions necessary are that only one membership prize should be allotted to each college, and that the papers submitted should be the work of a member of that year's graduating class. These papers might be on any topic bearing on original pharmaceutical work, possibly restricted to work done in the college laboratories, even the "thesis" of a graduate, if on original lines, might be accepted in the competition. A committee could be appointed each year to examine and pass on the papers submitted by the competitors, and their recommendations as to the prize winners be confirmed at the yearly meeting following the usual time of college graduations. Not to enlarge unnecessarily upon details that can be considered in due time, further remarks are omitted.

This plan seems to the writer to have a number of points in its favor; it

would gain for us every year a number of bright young members, whose pride and interest would be enlisted in keeping up their membership; valuable contributions to science might come from the work of the competitors, and the younger men going from college to business life would be familiarized with the American Pharmaceutical Association. Such a prize as honorary election to membership in such a body as the American Pharmaceutical Association would certainly interest the better class of pharmaceutical students, and would be earnestly striven for in almost all colleges of pharmacy. The remission of the first year's dues would serve as a further incentive. We could well afford to lose the few yearly dues for each year's awards for the sake of getting good, active members. Let all stress be put on the honor of the prize, and set a high standard of excellence for the competing papers—directly we will be benefited, indirectly pharmacy in general will receive good. As a still further incentive, the Association could offer a cash prize or a medal to the author of the best paper of each year's competition, say ten dollars in gold for instance. Also, all successful papers would be read at our meetings, if there is time available, and published in our Proceedings, and it might stimulate ambition, too, by publishing some of the most excellent in the pharmaceutical journals. Make the reward of good work honorary admission into the ranks of pharmaceutical workers and honorary proclamation of the identity of the workers.

If there should come from these suggestions any benefit to our beloved Association, the thought and study bestowed on them will be well repaid. With all modesty I offer them for your thought and study too.

The Chair stated that, without objection, the paper would take the usual course.

MR. PUCKNER: I should like to say a few words as to the effect this programme of the American Chemical Society has had upon the chemists of Chicago. We had a local chemical society there, and used to have an attendance of something like six to ten or twelve members for three or four months in the year. This local society went over to the American Chemical Society, and holds now its monthly meetings. The membership of the Chicago section is now probably 100 to 120, with a regular monthly attendance of from 40 to 50 or 60 members. There has been a vast stimulation of the work of the American Chemical Society by this system. These section meetings are well attended, as I say, and practically all our chemists have come into the American Chemical Society in this way, not so much for the sake of the American Chemical Society as such, but for the pleasure and profit of attending these section meetings. Instead of holding our meeting three or four times a year, as formerly, we now hold twelve meetings, where we bring up various scientific subjects for discussion. I think the plan would be admirable if followed by the American Pharmaceutical Association.

MR. KREMERS: I should like to ask Mr. Puckner how the local sections are run, and what relation they hold to the parent association respecting dues and so on?

MR. PUCKNER: The dues to the American Chemical Society are five dollars a year,

but that association now permits the local sections to withdraw one-third of these dues for the expense of running their meetings. The Chicago section has taken the initiative of not withdrawing any of the dues. The costs of the meetings are practically nothing, beyond the cost of postal cards sent out once a month, and we pass the hat occasionally to get up this small fund. So there is no need of withdrawing any funds from the society really. The Chicago section has taken this action, and I think other sections will follow that example. We meet at some club-room, provide a dinner at so much a head, and have discussion of chemical subjects. Sometimes we will invite some chemist to give us a talk on some original work, when we will have a short address, probably, and then general discussion.

MR. GORDON: I might say in explanation, if I did not make it clear in my paper, that membership in the American Chemical Society implies membership in the local section, and if a member changes from one section to another he notifies the secretary and the change is noted. The annual dues to the American Chemical Society cover all the charges the member has to pay, and membership in the general association carries membership in any local section where he may reside.

MR. FENNEL: I doubt very much whether we could apply that plan to the pharmacists of the United States. I am a member of the American Chemical Society, and I think I can see where the trouble would be here. We want to get the pharmacists from all over the country, and I do not think we could successfully get them into local sections. There is a difference in conditions as affecting the two societies. The chemists are all in the large cities, while a vast number of the pharmacists are not in the cities at all, but scattered over the country in the smaller towns.

MR. KREMERS: As far as the American Chemical Society is concerned, New England constitutes the Northeast section—several States together form one section. Michigan I think, is a section to itself, the entire State, and the members meet alternately at Ann Arbor and Detroit. And there are other sections of the country where similar arrangements would be possible. I do not think the American Pharmaceutical Association could do better than to organize local sections wherever feasible. As it is, only a small percentage of our members come to our meeting, and only once a year are they in touch with the Association as a whole. They get the volume of Proceedings, but many do not look at it. If the American Pharmaceutical Association, like the American Chemical Society, were in touch with its members monthly, it would be much better. The American Chemical Society has improved wonderfully in membership and support by the formation of these local sections. Some years ago I advocated in our State Association the organization of local societies by Congressional districts. Those of us who have been attending the meetings of the American Pharmaceutical Association for the last ten or twenty years know that there are comparatively few who, year after year—possibly not one per cent. of our members—regularly attend the meetings of the Association. It is necessary that we keep in touch with our members, and I think our failure to do so is one of the principal reasons why we lose so many of our members. At St. Louis and Philadelphia we received a large number of new members. After those meetings they possibly attended one other, but we may not see many of them again for ten years, if we do not do something to attract them. We must get together if we want to maintain the association spirit, and that can best be done by local-section meetings.

MR. MAYO: In order to get the matter before the Section in concise form, I move that the Section recommend that the general session adopt resolutions providing for the appointment of a committee to consider and report at the 1904 meeting a plan for the organization of local branches of the A. Ph. A. I doubt if such a plan can be worked out in less than a year's time.

Mr. Gordon seconded this motion.

A member here arose and suggested as a means of getting new members and keeping them afterwards, that they be allowed two years' membership for the price of one, saying that in that way the Association would get the money for one year and could remit the dues for the other. He offered that as a suggestion to the incoming committee. The Chair stated that the committee had nothing to do with that part of the matter.

Mr. Mayo's motion, just made, was then put to a vote and carried.

The Chair called on Mr. Ebert to read a paper he had prepared, and that gentleman read the following:

## LINES ON WHICH PHARMACY LAWS SHOULD BE DRAFTED.

BY ALBERT E. EBERT, CHICAGO.

The legal enactments governing pharmaceutical practice constitute a theme of perennial interest and importance. Especially is this true at the present time, when agitation in favor of changes in the pharmacy laws has become widespread. The trend of the proposed changes is to shift the maintenance of this legislation from the shoulders of the pharmacist to the general public.

While admitting that the regulations now in force have been suggested and shaped by pharmacists and were expected to conserve to their advantage, yet it is no less true that even our present laws do operate to the benefit of the public rather than the pharmacist. Certain it is that the protection and safeguarding of the public interest should be the prime motive of all such laws, and those framed with other ends in view must necessarily fail to achieve their purpose.

The foregoing considerations, trite as they are, may excuse the writer for offering this brief paper, for one who has enjoyed the opportunity of observing the progress of pharmaceutical legislation in this country, since its first inception, may be in a position to offer some suggestions for its revision.

First in importance among these suggestions is, that the supervision of the State should extend primarily and principally to the store itself; the owner or manager thereof being held personally responsible for the acts of his employees, should be allowed greater latitude in their selection, and registration should be required only of him. Restriction of the examination to those only who are candidates for ownership or managership would greatly reduce the number of applicants for examination and would enable the examiners to more thoroughly inquire into their competency and trustworthiness. No one should be admitted to this examination unless he or she has had four years of experience as a clerk and is a graduate of a reputable school of pharmacy. No one should be admitted to such a school unless possessing a high school education or its equivalent.

Decreasing the duties of boards of pharmacy as examining bodies would

give their members more time to devote to duties equally as important but now altogether neglected. I refer to the inspection of drug stores, with regard to the purity and strength of the medicines dispensed, the sale of narcotics, poisons or habit-engendering drugs, the care and preservation of the stock and the general arrangement of the store to safeguard against errors. We might here learn a valuable lesson from the practices of the older countries. In Europe, such inspections form a large part of the work of those to whom the enforcement of pharmacy laws is entrusted.

Pharmaceutical legislation, operating in this manner, would readily win the good opinion of the public, the present rapid increase of new stores would be checked, the commercial and professional standard of the business would be raised, the personnel of the trade would have the respect of the public much more than at the present time, and little difficulty would be met with in arranging for the maintenance of the law by the State.

Upon motion of Mr. Boring, the paper was accepted and referred.

The Chair stated that there were several other papers, but that as the hour was growing late he would suggest that they be read by title only. Thereupon he read the following titles of the nine papers yet on the list, which, on motion of Mr. Eliel, seconded by Mr. H. T. Eberle, were ordered received and referred to the Publication Committee:

"Pharmaceutical Education and Legislation," by A. J. Eckstein.

"Union Examinations," by Joseph Feil.

"A Step Toward Inter-State Registration," by Wm. A. Dawson.

"Reciprocity in Pharmaceutical Registration," by Gustave Wolff.

"The Necessity of Legislation Controlling the Sale of Narcotics," by Gustave Wolff.

"Drug Legislation," by W. D. Bigelow.

"Making a Profession by Law," by W. R. Ogier.

"Practical Education," by John F. Patton.

"On the Problem of Proprietary and Trade Names," by M. I. Wilbert.

The Chair announced that the time had now come for the installation of officers of the Section for the coming year, and said:

Gentlemen, I take pleasure in introducing to you Mr. Mason, your new Chairman. He has been a very faithful and efficient Secretary during the past year, and I have no doubt you will find him a model Chairman. [Applause.]

MR. MASON: I thank you gentleman.

Mr. Mason then took the Chair, and said that it seemed that Mr. Cliffe, the new Secretary, was not present, but he would appoint Mr. Kremers and Mr. Burke to escort Messrs. D. F. Jones and E. J. Kennedy, two of the new Associates on the Committee, to the stand, Mr. F. T. Gordon being absent. These gentlemen performed that duty, and Mr. Kremers introduced Mr. Kennedy.

MR. KENNEDY: Mr. Chairman and gentlemen, I shall endeavor to assist this committee and the officers as much as I can. I thank you for the honor.

Mr. Burke introduced Mr. Jones, and the Chairman said:

Mr. Jones, we are glad to have you with us, and I feel sure that a little of western "hustle" will be injected into the proceedings of the Section next year at Kansas City.

MR. JONES: Mr. Chairman and Gentlemen, I want to thank you for this honor. I did not know I was elected until this minute. I shall endeavor to do what I can to aid the Chairman in his work. [Applause].

THE CHAIRMAN: I believe that closes the programme, and a motion to adjourn is in order.

Mr. Mayo so moved, and the Section on Education and Legislation stood finally adjourned.

Text of Papers Read by Title

## PHARMACEUTICAL EDUCATION AND LEGISLATION.

BY A. J. ECKSTEIN.

Because my ambition has been, and still is, to be a practical pharmacist, it may be that I am prejudiced in favor of higher education in the training of pharmacists for their position.

To begin with, the druggist's position has directly to do with human life and happiness. One mistake on his part may prove fatal. Notwithstanding, youth are prone to go into the profession in a haphazard manner, many totally unfit for the work which they have outlined for themselves.

To engage in pharmacy as a life-work without having first prepared for it by a substantial fundamental education is not more wise than attempting to teach a child astronomy who had not yet mastered the rudiments of arithmetic.

It is well to offer as a forceful argument at the outset that there is a certain unwritten duty to the profession that should prove the incentive to every young man aspiring to pharmacy to acquaint himself with the theoretical and practical side of those studies that train the mind in right thinking and in reaching logical conclusions.

It is well to observe that, were it not for the observance of unwritten laws, society would not be able to stand. There are times, however, and we must all admit it, when duty may better be enforced than implied.

I am aware that the growing generation may find cause for complaint in that many practicing pharmacists to-day were granted licenses without having first complied with the conditions we see fit to impose. But standards are being brought to a higher plane. The march of civilization demands it. Other branches of science will not remain at a lower level to accommodate pharmacy, and it is certain that pharmacy cannot be dependent on the achievements of a few men.

Those wishing to enter the pharmaceutical field in order to gain a livelihood should pause and think that they are not going into a business where some guiding hand will direct them through all their work. Each must be an independent agent, endowed not alone with thought, but with the power to think rightly.

Physicians have complained, and their complaint has no doubt been just, that while the M. D. is required to undergo a thorough scholastic training, the pharmacist may, in most instances, engage in the study of pharmacy without having even a high school training. Educators know that primary education, such as one receives in the average high school, merely fits the mind to reason. The university alone should be the standard of the man entering into the study of anything that boasts the dignity of a profession. Before the physician begins to study medicine he must be equal to the task of passing a searching examination that would put to utter rout the student entering upon the study of pharmacy.

While I must painfully admit that reform cannot be brought to a head in a day, I believe that the next best thing is consistent agitation rightly directed and forcefully promoted.

The work being done by the American Pharmaceutical Association is worthy the support of every pharmacist throughout the United States. Let the individual pharmacist remember, however, that his part is not passively to look on and take for granted such changes for the better as are brought about. He must *act*. He must exert a personal influence. When it is demonstrated that druggists favor the enactment of legislation compelling pharmacy students to have a more thorough preparatory education, those who have the power to bring in force such regulations will, I believe, give it their earnest attention.

The American pharmacist is surely not looking for "the survival of the fittest" in his profession. He should look to it that all are equally fit, and that the standard of fitness compares well with the other professions, among which pharmacy should have its rightful place.

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On a par with higher education—so far as its relative importance to the drug trade is concerned—is proper legislation, and, on the other hand, the defeat of improper legislation. Without asking that undue rights be conferred on pharmacists, I am of the mind that the framing of bills, so far as their scope is concerned, should be left to competent druggists.

While the profession has been seriously menaced from time to time by bills presented to the Legislatures of the different States, I believe that ignorance, rather than any direct attempt to injure, was the cause. However, we must take this condition for what it is worth, and endeavor to correct it. Ambitious legislators, who have not the slightest conception of the requirements of pharmacy, ofttimes attempt to introduce bills and have them passed that would seriously conflict with the success of pharmacists.

While it is the duty of the legislative committees of the several State associations to deal with the bills in their respective States, without a national organization like the American Pharmaceutical Association, the pharmacists of this country would be in a sad plight indeed.

Although I do not suppose that we, in Minnesota, have experienced anything worse on the average than druggists have in other States, we have had ample opportunities of seeing the impending effects of wrong legislation. For instance, the bill proposing to impose a liquor tax on all druggists selling medicines or cordials containing over 2 per cent. of alcohol was the conception of a man who had but a slight idea of what was just or unjust in a matter of this nature. If legislators lack knowledge—which is frequently the case—the party attacked by freak legislation must combat intelligently. The only way to accomplish the given end is to act as a unit.

The upward trend of pharmacy is gratifying, even though we may find cause at times for deploring certain conditions. The fact of pharmacy's progress is ample proof that we are working along the right lines. Pharmacy is undergoing a change for the better, and this betterment is due entirely to the union of pharmacists.

It is a wise policy, no doubt, to lean toward neither optimism nor pessimism too strongly. Looking at things in a light too rosy or looking at things through smoked glass does not reveal the true condition.

In striking a happy mean, practical in its scope, the American Pharmaceutical Association is destined to accomplish most commendable results, and in no departments of its endeavors will it achieve more marked success than in its efforts to better the educational features and legislation.

## UNION EXAMINATIONS.

A Suggestion Towards a Foundation for a National Pharmacy Examination.

BY JOSEPH FEIL, PH. G.

The great desideratum at present is a national pharmacy examination. It is not my purpose to indicate how this shall be conducted, nor question in any manner the details of such a proceeding. I have in view a method which shall tend to bring about such a condition by gradually making State Board examinations uniform to a great degree, and likewise make certificates to practice pharmacy valid in contiguous States.

The most popular argument to present in favor of the examination to be described below would be that it might materially aid to balance the supply of assistant pharmacists to a great extent in adjoining States; while this would help to bring into practical use the method to be suggested, yet the real purpose is to eventually call into existence a much greater object. I do not claim this is the only way, but rather bring it to your attention as a beginning, and hope with further study and attention to this subject by many able pharmacists to bring about a national examination within ten years at the farthest.

The method of union examination I would suggest is as follows: States bordering each other could appoint a committee, say of one member from each Board, to prepare an assistant pharmacist's examination, in difficulty about five to ten per centum above the ordinary one usually demanded, the examination to be held simultaneously in each State involved, that is, on the same day, the papers to be graded by each Board, and rating to be at least five per centum above the mark usually demanded, or at least the standard to be as high as the maximum demanded by any of the interested Boards.

Any method which would require an examination to be held at any particular town or city alone for all the Boards would probably involve some legal points, though it is quite possible that such a method might prove feasible in some cases, especially where Boards are legally permitted to recognize other certificates if they wish to.

As regards fees, the logical procedure would be to demand the total fees of all the Boards giving such union examination.

The main point to keep in view is this, an examination to be conducted by the authority of several Boards at once and the great object of bringing uniformity in examinations by this method.

If you want a thing, the surest way to get it is to go for it yourself, and if pharmacists desire to bring about an early national examination, the positive way to bring about such a result is to make the Board examinations so uniform that they shall be national, and then the legal part of the matter can be secured without difficulty.

*Cleveland, O., July 20, 1903.*

## A STEP TOWARD INTER-STATE REGISTRATION.

BY WILLIAM ARTHUR DAWSON, HEMPSTEAD, N. Y.

The creation of a National Board of Pharmacy by fiat of federal law is a legal impossibility. To regulate the practice of pharmacy within its borders is a sovereign right of each state, a mere matter of police duty over which national law can exercise no control.

Inter-state registration in its widest sense—meaning "registered in one state, registered in all"—is a financial impossibility, because no state is willing, nor can afford, to forego its Board of Pharmacy examination fees. Nor are such states as have reached a high standard of professional qualifications willing to admit without examination the licensed practitioners of states in which the standard of requirement is thought to be lower than in its own.

What is needed by the individual pharmacist is some plan that will enable him to buy a pharmacy, or take a situation in another state, without being compelled to go to the trouble and expense of preparing for and taking another examination: to be able to take quick advantage of a business opportunity in a neighboring state without the risk of a large mon-

etary loss or personal humiliation should his memory fail to recall the right answers to a few text-book questions learned and forgotten years ago.

He does not object to paying the fee of the board; he would willingly pay double or ten times that sum to be relieved of the work and worry of the examination. If then there was some recognized authority, some extra-legal court of review before whom he could take the evidences of his professional qualifications and have his competency certified to, and have his certification accepted by the board of pharmacy in question as ample proof of his being fully qualified to practice pharmacy in any part of the United States, the question of inter-state registration would be settled to the complete satisfaction of the individual pharmacist. He cares nothing about being registered in every state in the Union, nor has he need of such a right; all he needs is to be relieved of the necessity of standing another examination whenever he moves across a state line.

As a step, then, toward inter-state registration, in this sense, I beg leave to offer the following suggestions:

That the American Pharmaceutical Association create a committee on standard educational requirements and professional qualifications, to be known as "The National Board of Regents of Pharmacy," a continuous executive body, consisting of three members, whose duties shall be:

1. Upon request, and the payment of a suitable fee, to review and pass upon the evidences of professional qualification of licensees, by examination, of any state board of pharmacy, and, in the case of those who, in the judgment of the Board of Regents, are fully qualified and competent to practice pharmacy in any part of the United States, certify that effect and to recommend them to all state boards of pharmacy as being worthy of registration without further examination.

2. To formulate and fix, from time to time, standards of pharmaceutical qualifications and legal regulations, and urge the adoption of uniform laws and regulations in all States, *e. g.*:

A standard pharmacy law to serve as a model and guide in enacting state pharmacy regulations.

Standard state board examination requirements: the minimum number of questions or problems and amount of practical work that should be included in the state examination; the number of questions or amount of work to be devoted to each of the correlated sciences and the nature or kind of questions or work best adapted for testing the fitness of a candidate.

A standard curriculum of pharmaceutical education. The minimum amount and kind of studies that should be included in a college of pharmacy course, or is best adapted to the purpose of turning out competent pharmacists.

Standard rules, regulations or by-laws for the conduct and procedure of state pharmacy boards with the greatest degree of economy and efficiency.

3. To secure the friendly co-operation of state pharmacy boards in carrying on this work, to the extent of adopting its standards and recognizing its certificates and furnishing confidential information regarding such

state board licensees as shall apply to the Board of Regents for certifications of their qualifications.

As will be seen by those who are familiar with the workings of the Board of Regents of the University of the State of New York, this plan is simply an adaptation of some of the features of that body applied to pharmacy.

While the Regents of New York State are neither an educational nor examining body, and are entirely separate and distinct from the public school system, they absolutely control the educational system of the state. They fix the standards for every course of study, send out standard examination papers, and review and certify to the standing of every scholar in every public or private school in the state that conforms to its standards and abides by its regulations. No school, public or private, is compelled by law to adopt its standards—although failure to do so would deprive the former of any state aid—but every private teaching institution of any importance in the state adopts its standards and regulations because of the value of its certificate. Scholars demand them, and regard schools that are not under Regents' control as not being up to the standard. Armed with his Regents' certificates the scholar may go to another school and be enrolled at once in his proper place, the Regents' certificate being accepted as ample proof that its holder has done a certain named amount of work in a standard curriculum. Without it he would be compelled to stand an examination to ascertain what class he should be admitted to. He may go to a higher educational institution, show his certificates, and be registered without being compelled to take the entrance examination. The State Board of Regents have neither educated nor examined this scholar, but they have *reviewed and verified his examination* and have established the educational standards in the school wherein he *was* educated.

Its standards are not legal standards, but authoritative. Not made by law, but recognized by law, as being efficient and proper standards; similarly, the standards of the U. S. P., although not made by law, are accepted in law as proper and authoritative standards.

That the certificates and standards of a National Board of Regents of Pharmacy will at once be accepted and recognized, is not expected. Anything like general recognition will be a matter of time. The Board of Regents, being without legal power, must command respect as an extra-legal authority; a supreme court of honor, whose impartial judgment and expert knowledge is unquestioned.

There can be little doubt but that a National Board of Regents of Pharmacy, rightly organized and ably conducted, would eventually become the supreme authority on all matter pertaining to pharmaceutical ethics, education and state regulation; its certificates, standards and recommendations receiving the recognition and adherance of one pharmaceutic

body after another, as its ability became manifest, and as prejudice, conservatism and inertia were overcome.

The most important feature of this proposed plan for the organization of a National Board of Regents of Pharmacy, is the issuance of certificates of professional qualification to individual licensed pharmacists; and it is to this part of the work that the Board should first give attention; standards may come later.

It is the income from certification fees that will make the National Board of Regents a self-supporting body, and, it is this certifying power that will make pharmacists, individually, personally interested in the work of the Board.

It is expected that the fees from certificates will pay the expenses of the Board as the work is done and will allow of a portion of each fee being turned into a general fund and thus furnish a working capital for the Boards work upon standards.

To make clearer the matters relating to the certification work of the Board of Regents, I will state, that what I have conceived would be its procedure in passing upon and certifying to a candidates professional qualifications, is somewhat as follows:

"A. B.," having applied to the Secretary-Treasurer, or chief, of the National Board of Regents, receives from that officer a printed application form and instructions. The application form, when filled out and sworn to, is returned to the chief Regent and with it, certain credentials called for in the instructions, and, the fee required.

The chief Regent examines the application and credentials and from the information contained therein gains a fairly accurate idea of the applicants' life history and a knowledge of his pharmaceutical career in all its important details.

To corroborate some of the statements made in the application and obtain further information about the applicant, the chief of the Board of Regents then mails form letters, asking for confidential information upon certain points bearing upon the applicants' professional ability, to references named in the application, former employers, preceptors, officials and instructors of the pharmacy school attended, and the president and secretary of the state board that examined and licensed the applicant.

If the applicant is a recent licensee of a state board that co-operates with and recognizes the National Board of Regents of Pharmacy, it is expected that latter will have the privilege of reviewing the examination papers and other data connected with the applicant's examination by the state board; such data being forwarded to the Regents when requested and returned to the state board as soon as they have reviewed them; information thus obtained to be regarded as strictly confidential and kept inviolably secret by the Board of Regents.

When the replies to these letters of inquiry are all in, the chief Regent reviews all the information and evidence before him, gives a rating, and forwards all the papers to the second member of the board, who in turn reviews and rates and then forwards the papers to the third member, who treats them similarly and mails them back to the chief. The latter again goes over them in detail and places them on file, and, if all is satisfactory, issues a certificate to the applicant, or, if not, notifies the applicant that he has not proved his case.

It is recommended that the National Board of Regents consist of three

members. As all the work of the Board will be done through correspondence by mail, this number is calculated to perform its duties with greater efficiency and expedition and be less unwieldy in its working than would a larger body; while its certification and other authoritative dicta would carry fully as much weight.

A board of three members would also be the most economical number financially, as each member must receive a fee that will recompense him in some degree for the time spent in certification work.

Ten dollars seems about the minimum sum for which such a board could undertake to review and pass upon a candidate's professional qualifications, and as the work involved would be the same in any case, no part of this fee could be returned to the candidate in case he failed to produce conclusive evidence of professional competence.

This ten-dollar fee would be expended about as follows:

Chief of Board of Regents, $2; other members of Board, $1 each; Secretary of State Board furnishing information and examination papers, and the Secretary of college of pharmacy furnishing like information, $1 each. These fees are paid at once, being forwarded with the papers and request for information, out of the candidate's fee, and the remaining balance turned into the general fund of the board, out of which will be expended the expense of mailing, printing, etc., amounting to a dollar or more in each case. This surplus may be allowed to accumulate to form a fund for the campaign for education that will be a necessary preliminary to the general adoption of uniform standards of pharmaceutical education, examinations, qualifications and state regulations.

By this plan the work is made to pay as it goes; if it doesn't go there's nothing to pay. If no certificates are applied for, there is no expense incurred; if there are, the work is paid for in advance.

I have not the least doubt but that the certificates of the National Board of Regents will be applied for, to some extent, from the very first; even though they are not recognized by a single pharmaceutical body. Pharmacists will desire the Regents' certificate for many other reasons, as an adtional honor, a diploma of merit, an evidence of professional ability, a positive proof of high qualification and competency in the practice of pharmacy, certified to, signed and sealed by the highest pharmaceutical body in the land.

Also, there is a probability, almost amounting to a certainty, that these certificates will some day be recognized by all State boards of pharmacy.

At the least, considered merely as an honorary degree in pharmacy, the certificate of the National Board of Regents will be well worth the seeking by every ambitious pharmacist.

I can conceive of no valid objections that could be offered by any State board to such a National Board of Regents. It will usurp none of their rights or privileges, nor deprive them of any of their fees. On the contrary, it might augment their income to some extent by facilitating the moving about from State to State by pharmacists.

Nor can I imagine any valid objections that would lie against the taking up of this work by the American Pharmaceutical Association. It will in no wise interfere with its present work or alter the course of its usefulness. The expansion of its work along the lines that are indicated in this plan is in consonance with its labors and aims in matters pharmaceutical, and is calculated to make it in a greater degree than ever the leader, guide and standard-bearer of American pharmacy.

I most respectfully beg to suggest that the American Pharmaceutical Association begin the work now, by appointing a committee on the organization of a National Board of Regents of Pharmacy, to report upon the matter at the next meeting of the Association.

As a committee of the American Pharmaceutical Association, the National Board of Regents of Pharmacy would be entirely under the control of the Association. It would present its report at the annual meetings and receive such general instructions, by vote and resolution, as the sense of the meeting dictated.

It is suggested that the members of the board be elected by ballot—one regent to be elected each year, to hold office for three years, with rotation in office, the newly-elected member being the third member of the board the first year, second regent during his second year, and chief regent during his third and last year. It may be advisable to declare any member as ineligible as a candidate within a year or more after having served on the board, so that there will be no opportunity for the exercise of personal power in office by any member. Those affiliated with State boards or pharmacy schools should also be ineligible to election as national regents.

The Board of Regents will create another honor for American pharmacists to aspire to, one of the highest honors attainable in American pharmacy.

## RECIPROCITY IN PHARMACEUTICAL REGISTRATION.

BY GUSTAVE WOLFF, NEW YORK CITY.

For the last meeting of the American Pharmaceutical Association in August, 1902, fifty titles for papers were previously propounded in the pharmaceutical journals. "Obstacles to Interstate Reciprocity in Registration and How They May be Overcome," is one in relation to which the author has a strong feeling—although of a one-sided kind. Let him monopolize the reader's attention for a short time. At the start, I mean to say that "reciprocity" does not mean "national legislation." Many desire a law passed by Congress commanding every board of pharmacy to re-license on other licenses. Others contend that the Eastern States being superior in pharmaceutical standard, should alone obtain reciprocity.

Between one maintaining that reciprocity be not entertained at all, and the other maintaining that every state, whatever its standard, be in-

cluded, we find all shades of opinions. The passing of a national law as indicated above, is out of the question, because the United States Constitution reserves such rights to the individual states. They cannot be taken away unless the Constitution be changed, which change is unlikely to be made.

If we ask: "Why don't the States *individually* agree without waiting for constitutional changes?" and "if their standards are not alike, why not adopt a golden mean?" the question arises: "What is this golden mean?" To overcome this difficulty, a scheme has been propounded in the "Medical Record." Changing the "medical" to pharmaceutical," it stands as follows:

Let delegates be appointed by the boards of pharmacy, consisting of one or more members, as could be agreed upon, and at a convention choose a committee representing the various shades of pharmaceutical standards. The delegates from New York, New Jersey, Pennsylvania, Massachusetts, Rhode Island, Connecticut, etc., might then agree who should represent them. In this way delegates should also be selected for Florida, Georgia, North and South Carolina, etc., representing the South, and from the delegates of the balance of the states the representatives of the West. In that way the number of delegates could be shrunk down from say 100 to about 20 members of the committee. This committee could then formulate rules to govern thereafter a Board of Examiners, to be selected by them. For instance, it could specify the length of time of, and intervals between, examinations, how long an apprenticeship, and what length of study in college should be demanded, the age of applicants and the method of proof, and whether, and to what extent laboratory tests should constitute the examination, whether pharmaceutical, chemical, toxicological, microscopical, or whether urine analysis should be demanded. This committee might submit such rules to the main body, having chosen them, and by a majority vote have them rejected, amended or adopted. Certain resolutions finally being adopted, the sub-committee should select five members, these to be the Board of Examiners. This board should have no power to change the rules laid down for its guidance, but could make suggestions annually to the body having selected them. Every year one member should drop out and one new one be elected.

Who would likely be chosen an examiner? We need not go into personalities, but we may prophecy the election of such men as Professors Remington, or Coblentz, or Diekman, or Hallberg, or Mr. Ebert. None but excellent men should be chosen. We always have selected such to compile the Pharmacopœia, and will select just as excellent men as examiners.

This Board of Examiners should meet in Washington bi-monthly, and besides hold annual meetings in the three large sections of the country for the examination of candidates from each section, and also hold examina-

tions in Spring, in cities which have large pharmaceutical colleges, turning out a goodly number of graduates yearly.

The successful candidates should be given certificates, which I admit would not entitle them to a *legally enforceable* recognition in any State. But in the same way as the Pharmacopœia is our standard *by custom* and *not by law*, and as there is no restriction in the United States Constitution forbiding the Boards to recognize other standards but their own, and as State laws forbidding such could be easily enforced, I see no valid objection to this scheme. For the benefit of applicants not wishing to take the national examination the State Boards should continue to examine and to grant State licenses. The great majority of young men capable of passing the national examination would prefer to be able to get a license in their home State, and to be able to get the same in any other State without further examinations by paying the prescribed fee.

The candidate may expect to settle in New York or Chicago, but chances may send him to Oklahoma, Texas, the Klondike or the Philippines, or he may fall the slave to the charms of one of our Porto Rican or Hawaiian belles.

As long as the individual Boards would indirectly elect the main committee, making the rules and regulations before mentioned, they would dictate on what lines to proceed in just as strong a measure as at present, looking at them as a whole. Looking at them, however, as individual Boards we admit that they would give up some peculiarities of their own examinations which they would like to retain, but which would not meet the approval of the majority. In unity is strength, and the best spirits of our calling will formulate better rules than any of the Boards singly. A National Board would be untrammelled by petty influences as wielded now by certain pharmaceutical associations and colleges. The examiners should not even know the names of the candidates, their papers being rated under a nom de plume or number, as for the Federal Civil Service.

If many colleges of pharmacy would be compelled to adopt a standard approximating that of New York and Philadelphia it would enhance their standard, and such examination would be their guiding star. Assuming that a graduate of a prime college of pharmacy, with four years' experience in stores, is better qualified to pass a stringent examination than one having had no laboratory training or lectures and little home study, and whose store experience may have been acquired in a rural section, there is an apparent hardship in this proposition. But such candidates, finding that their chances for passing the National Board are less bright than with their home Board, cannot raise a fair objection if they are still permitted to do so, if their State Board admits those who have passed the national examination. These would be better qualified, and it would be ridiculous to require their examination.

It is certain that such national board, out of its great fees—say $20—

would be able to pay handsomely the gentlemen composing the board, and we would secure the best men in our profession. Members objecting to receiving a salary for their services could use it for striking off medals for the candidates proving most qualified, as a stimulus to others. Some members of the board would be able to do so. This national board should set a standard examination, to be increased little by little, until it surpasses the standards of our best colleges, suiting the most scrupulous. The number of examinations could be increased—Latin inserted; bacteriology added; the number and length and difficulty of questions could be increased from half a day to three days, until finally the requirements for preliminary education would receive attention, and high school graduation aimed at as a preliminary requirement. The Regents of the State University of New York demand from the candidates applying for licenses to practice medicine to have forty-eight academic counts; a certificate of B. A. is demanded at Johns Hopkins University, at Baltimore. Such should be our standard. If we shall see the day when our profession is exercised by this type, then I assume we shall approach the day when our difficulties will begin to shrink rapidly. Let us not picture the millenium; let us not assume that the future will be free from difficulties. But we can hope that the pharmacist selling "Tartarate of washing soda" for citrate of magnesia will then be fully a historic relic. Do not let us talk to-day of the "profession, not trade, of pharmacy," before all druggists are worthy of the name "scientist" by rendering altruistic services. Before being entitled to that he has to have an excellent general and technical education. To look down upon the mechanic as beneath you, he having no title, does not make a scientist of an ignoramus. The passing of a stringent examination will be soon recognized by the public as a standard by which to gauge the scientific man, and be shown by increased esteem and profits. Probably then the public will not be angry at the pharmacist dispensing a bottle of medicine at "full price"—label off—over the prescription counter, instead of selling same "cut-rate" over the sales counter. The physician will see that it is arrogant and foolish of the smooth-tongued representative of a manufacturing concern to try to talk him into prescribing "Elixir pasca caca active, made by special laboratories," instead of the N. F. preparation of the pharmacist, dispensed *secundum artem*.

If we ask, "How can this scheme be executed? How can we convince the majority of our brethren that it is desirable, and, if so, that it should at once be executed?" All these objections I waive by pointing out that it is unnecessary to get all retail druggists into line to execute this, it is only necessary to get into line the Boards of Pharmacy of New York, New Jersey and Pennsylvania and hold a combined meeting with the present Washington board and set the ball a-rolling, and after that more boards will fall into line.

Even the United States started with thirteen states. Even if the South

and the West will not fall into line, being afraid that a higher standard may injure their colleges, we would at least make a step forward in the East and eradicate the necessity of candidates passing half a dozen examinations in going from one eastern state to another.

Some may say that "A rolling stone gathers no moss," and "the number of druggists migrating from one state to another is small." Many drug clerks in New York wish to cross the Hudson to take employment in New Jersey, or vice versa, and having passed his second examination there, desire to return to New York, and is possibly engaged by an employer having a branch in Newport, R. I., where he would take his third examination. Afterwards he may go to Connecticut, less than thirty miles distant, where he again is confronted with a next examination. Re-examinations hit hardest the most competent men, having by long experience become rusty in theoretical lore.

Speaking of board requirements, we regret that the time when a pharmacist opening a pharmacy in New York City, was compelled to be a graduate of a college, has passed long ago. Such was the rule of the first board of pharmacy, well remembered by our elder brethren. The standard set afterwards was not lax; stringent examinations were required. At one time the New York City board had the reputation—some called it notoriety—that it could not be passed by any mother's son unless he be a graduate of a No. 1 college of pharmacy, but this time has also passed. Now we see the Board of Pharmacy throw off Chemistry and Materia Medica. This means playing Hamlet, leaving the Danish Prince out. Naturally the percentage of applicants passing the examination will grow larger. Many candidates passing would have been deemed unfit in former times, and the public and pharmacists do not get what they contracted for. That the eastern section of the board does not cherish these changes does not alter the facts.

If the boards of pharmacy were relieved of the necessity to examine candidates, they could devote more time to the investigation of matters now attended to by the boards of health. The number of druggists selling adulterated drugs and substituting in prescriptions would grow smaller. There is no better way than to split responsibilities and leave to the board the regulation of pharmacies, and to the examiners the examinations.

If these suggestions result in stirring up comments, favorable or otherwise, the writer hopes that from these comments, some good will be derived. If in time all pharmacists in the United States will excel the highest type produced in Europe, the author feels that if he has carried one brick to the building, he did not strive in vain.

## THE NECESSITY OF LEGISLATION TO CONTROL THE SALE OF NARCOTICS.

BY GUSTAVE WOLFF, NEW YORK CITY.

Every druggist in our large cities, and some in our rural districts, has had calls for narcotics, especially morphine and cocaine, from habitues. Some have followed the rule to never sell them under any circumstances except upon prescription. Others have strictly followed the state laws, whatever they were, and have sold them under the law's restrictions; and still others have sold them right and left, law or no law, with a happy-go-lucky countenance to "Tom, Dick and Harry." An actual comparison of the quantities of these drugs manufactured and imported with those *bona fide* prescribed or used for chemical purposes would undoubtedly reveal the fact that enormous quantities are sold to people who, by rights, should never get any. Besides the two mentioned drugs, chloral hydrate and acetanilid may be classed with them. The consumption of these drugs is steadily increasing. More and more patent medicines spring up containing them. Some contain cocaine, and are used largely not against catarrh, but with the morbid desire to use cocaine in order to imitate some one doing the same. We are closely approaching conditions similar to those at one time in England concerning "McMunn's elixir of opium," which necessitated the passing of an act of Parliament. It will be admitted that it would be better if the use of alcoholics for exhilarating purposes were unknown. It will also be admitted that it would be vastly better if narcotics could not be used promiscuously by the laity. Admitting this, we ask, "How can this evil be remedied?" The manner of the liquor prohibition is hardly applicable. We can neither apply the South Carolina dispensary law nor the New York tax-screw method.

A method restricting the use of these drugs successfully would be to apply the same scheme which the Internal Revenue Department applies to tobacco in order to collect the tax. From the moment of raising the crops to the moment of emptying the box it is fathered by the revenue department. Even the empty box must not be filled again. If we would collect a tax of ten cents a pound, no one could claim that the tax is oppressive. But we would have to submit to the strictest regulations in listing, checking, selling, putting up, and so on. The revenue department would furnish the blanks. They could account for every grain that is made or imported, and the manufacturer selling to others but druggists and analytical chemists would be soon in the clutches of the law. His license to manufacture narcotics and his bonds would, on repetition of the offence, be forfeited. The retailer who could not account for the quantities bought, by filing copies of the Rs in which it has been used, would soon have his license at stake, and so would be his clerk's license. A clandestine manufacturing and selling would probably start in the same way as the moonshine distilling, no matter what law is passed, but the shameful conditions which

have existed in Memphis, Tenn.,—that colored children were able to buy for a nickel cocaine, like candy—these would not continue.

But we need not go to Memphis, but admit that in our Tenderloin probably these drugs are sold. It is useless to imitate the ostrich, who buries his head in the sand, and then imagines because he cannot see, no one can see him. Every few days we read some statement in the papers about so-and-so having committed suicide despondently, he being addicted to using these drugs. Where there is smoke there is fire. Let us have a chat with Druggist Pillroller, selling these drugs, and hear what he has to say. Audiatur et altera pars. He says that he does not like to sell it; he is not hungry for the profit made, but he has gradually drifted into selling them almost before he knew it himself, and he would stop it if he could, but—he will have a lot of "buts"—his neighor sells it; and second, if his neighbor did not sell it, the fiend would obtain it by the pound from the wholesaler, not getting it by the grain. He tells you that the wily customer posed as a doctor, druggist, chemist, wrote prescriptions in English and Latin, finally tearfully broke down, admitting to be a fiend, and imploring Pillroller not to let him suffer and to give him, "please, please," his "dope," almost going down on his knees. The pleadings and apparent suffering of the poor wretch prompted him to give him the drug in order to do a Samaritan act. After the fiend had obtained that drug once he was soon back again, and as Pillroller had said "A" he said "B." Soon the customer brought his friend, who said he was boarding with him, and whom he intended to use as a messenger. In a short while this deceit was given up, and Pillroller found that also the "messenger" had been using the drug for years. Also he got the drug, even as No. 1 was in the hospital or dead, having drifted out of sight. Pillroller swore by Æsculapius he would not allow any more messengers. One day he saw No. 2 anxiously looking out of the door while purchasing, and questioned what he was looking for, said that he expects to meet somebody. Pillroller's curiosity was aroused, and he saw his customer handing half of his purchase to another party. Both look embarrassed, being detected, but finally state that "Pillroller having been so awfully strict," customer No. 3 had to do it that way. At that time Pillroller gave up; he made up his mind to keep on doing what he had been doing, to sell to A, B and C; he makes up his mind hereafter not to care if D, E and F gets it; that if those devils intend to kill themselves he will not try to stop them. A superintendent of a reformatory he did not intend to be, and they not his wards. They were adults, fully knowing what they were doing. There the druggist stands like Hercules on the cross-road, and if he chooses the right road, that is, gives up selling it, even to those "selected few," he is well off. It is only human that some "Pillroller" choses the wrong road. If at that time the druggist would be strengthened in his good intentions by the knowledge that his license as store-keeper and as individual phar-

macist is at stake, he would not go the wrong way; indeed if such law were enacted he would not have to stand on the cross-road; he never would have sold it and no more have thought of doing so than of performing surgery in his back room.

If we ask how, in detail, these sales may be restricted we say that the most essential step is to first get statistical data, determining how much there is to be remedied. The second step would be to determine the method of remedying it. That whole matter has to be started from the bottom up. The importation and the manufacturing should be done under state control and statistical lists be compiled. The next step to regulate is the selling of these drugs by the manufacturer to the wholesaler; then the selling by the same to the retailer, and lastly, the supervision of the uses made of them by the retailer. Look at the regulation of a big stream to prevent floods. You have to start up in the mountains where the small rivulets come from. You have to regulate the felling of the timber, otherwise the snow melting in the spring, has not the mossy soil to be absorbed by, but melts at once, runs into those small rivulets, fills them to overflowing and naturally the river, fed by them, is filled to the brim. Those foaming rivers enter the big stream with ten times the usual quantity of water, they fill the bed of the big stream at once and soon all the dams and bulwarks are swept away, thousands of lives lost, the crops destroyed. By a systematic scheme well carried through, we shall blot out this stain on our fair shield of honor.

## DRUG LEGISLATION.

BY W. D. BIGELOW.

Chief of Food Laboratory, Bureau of Chemistry, U. S. Department of Agriculture.

Of the fifty-three States and Territories included in the United States and its insular possessions, thirteen have enacted laws regulating the manufacture and sale of drugs, having especial reference to their quality and purity. This statement is not intended to include laws regulating the practice of pharmacy.

Drug legislation is ordinarily intimately connected with food legislation, and in twenty-eight States commerce in drugs and foods is regulated by the same laws. Many of the acts relating to both subjects were enacted for no apparent reason, and often no attempt whatever has been made to enforce them.

The requirements of various States differ greatly among themselves. This lack of uniformity has led to considerable difficulty in enforcing the laws, and has caused much embarrassment to both manufacturers and dealers. For this reason an attempt has been made for many years to obtain the passage of a Federal food and drug law for the control of interstate commerce. It is believed that such a law would greatly assist in the enforcement of the State laws, since it would make it possible to punish

the malefactor, and to relieve from embarrassment an innocent retailer. Up to the present time, however, no Federal legislation has been enacted with the exception of the act relating to imported drugs (R. S. 1878, sec. 2933–2939), and the act making appropriations for the Department of Agriculture (1893, Public, No. 158), which reads as follows:

To investigate the adulteration of foods, drugs and liquors, when deemed by the Secretary of Agriculture advisable; and the Secretary of Agriculture, whenever he has reason to believe that articles are being imported from foreign countries which by reason of such adulteration are dangerous to the health of the people of the United States, or which are forbidden to be sold or restricted in sale in the countries in which they are made or from which they are exported, or which shall be falsely labeled in any respect in regard to the place of manufacture or the contents of the package, shall make a request upon the Secretary of the Treasury for samples from original packages of such articles for inspection and analysis; and the Secretary of the Treasury is hereby authorized to open such original packages and deliver specimens to the Secretary of Agriculture for the purpose mentioned, giving notice to the owner or consignee of such articles, who may be present and have the right to introduce testimony; and the Secretary of the Treasury shall refuse delivery to the consignee of any such goods which the Secretary of Agriculture reports to him have been inspected and analyzed and found to be dangerous to health, or which are forbidden to be sold or restricted in sale in the countries in which they are made or from which they are exported, or which shall be falsely labeled in any respect in regard to the place of manufacture or the contents of the package.

To enable the Secretary of Agriculture to investigate the character of food preservatives, coloring matters, and other substances added to foods, to determine their relation to digestion and to health, and to establish the principles which should guide their use; to enable the Secretary of Agriculture to investigate the character of the chemical and physical tests which are applied to American food products in foreign countries, and to inspect before shipment, when desired by the shippers or owners of these food products, American food products intended for countries where chemical and physical tests are required before said food products are allowed to be sold in the countries mentioned, and for all necessary expenses connected with such inspection and studies of methods of analysis in foreign countries; to enable the Secretary of Agriculture, in collaboration with the Association of Official Agricultural Chemists, and such other experts as he may deem necessary, to establish standards of purity for food products and to determine what are regarded as adulterations therein, for the guidance of the officials of the various states and of the courts of justice.

This act affords no help to inter-state commerce, but enables us to control to a certain extent the character of drugs imported from foreign countries.

In those states which have seriously attempted the enforcement of the drug law the term "drug" is usually defined as including all medicines for internal or external use, antiseptics, disinfectants and cosmetics, and a drug is declared to be adulterated: 1. If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality or purity prescribed therein (unless the order therefor requires an article inferior to such standard, or unless such difference is made known or so appears to the purchaser at the time of the

sale). 2. If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia or other standard work on materia medica, it differs materially from the standard of strength, quality or purity prescribed in such work. 3. If its strength, quality or purity falls below the professed standard under which it is sold.

Legislation of the general nature of the above has been enacted in the following states: California, Hawaii, Indiana, Kansas, Massachusetts, Mississippi, New Hampshire, New Jersey, New York, Ohio, South Carolina, Texas and Wisconsin. In many of these states, however, these laws are a dead letter, and although patterned after workable laws, no officer has been placed in charge of their administration, no appropriation has been made available for that purpose, and no attempt has been made to enforce them.

In Pennsylvania detailed definitions of adulteration as applied to drugs have been adopted, but this legislation is not a part of the food laws which are efficiently administered in that State, and no provision has been made for its enforcement.

In the Philippine Islands the law requires that drugs shall conform to the United States Pharmacopœia.

A simple prohibition of the adulteration of drugs is found in the statutes of Arizona, Florida, Idaho, Illinois, Michigan, Minnesota, Missouri, Montana, Oklahoma, Rhode Island, Tennessee and Wyoming. This law is practically nullified by a provision requiring proof of fraudulent intent to be necessary for conviction.

In the District of Columbia and New Mexico it is required that drugs shall be of the nature and quality demanded by the purchaser.

The laws of Alaska, Colorado, Kansas, Kentucky and Virginia contain the unique provision that drugs must not be adulterated with any substance *injurious to health.*

Colorado, Connecticut, Iowa, Nebraska and New Mexico do not permit drugs to be mixed or altered so as to lessen their value or efficiency.

The foregoing statements are purposely made quite general. Only a very broad classification has been made. Further detail and more exact statements have not been attempted in this paper because of the amount of space that would be required on account of the great diversity of the laws of different States. The food and drug laws (not including laws regulating the practice of pharmacy) have been compiled by the writer and published as Bulletin No. 69 of the Bureau of Chemistry, United States Department of Agriculture. This bulletin includes the laws in force January 1, 1902, and is being revised to include all the laws in force July 1, 1903.

## MAKING A PROFESSION BY LAW.

BY W. R. OGIER.

The science of pharmacy differs from that of medicine in that it is so linked with non-professional characteristics as to prevent its speedy evolution into a profession equal in rank with any of those recognized as such.

Architecture, sculpture, music and painting are arts, and perhaps the true classification of pharmacy in its present state is that of an art. That it should ascend in the scale one or more points is devoutly hoped for, but really anticipated by few of its followers.

The reason for legal restraint in the practice of this art, lies in its capacity for injuring the people, and it is the legal regulation which has given it such impetus toward the status of a profession as it has so far attained.

Practically all the states and territories now have pharmacy laws, and the existence of these is simply in recognition of the need of some protection to the public from the ignorant and unskilled artisan who seeks by this method to gain subsistence from his fellows whom he is not qualified to serve.

Arts which are powerless to work physical or moral harm upon humanity are not recognized as proper subjects for legislative control in a democracy.

The control of the state over this art is not manifest to the extent of its power, but to the minimum of necessity for public safety.

Representatives of the people in legislative bodies reflect in general the sentiment of their constituents upon questions which affect their comfort or safety, and this sentiment has developed only far enough as yet to provide and execute laws relating to pharmacy which do not compel a high professional standard of qualification for its followers.

Laws which provide for examining boards not restricted in the character of their examinations, and which require that all persons wishing to engage in the art of pharmacy must submit to an examination prepared by some one of these boards is all that can be reasonably expected at this stage of development in public sentiment and in the present mixed nature of the pharmaceutical art.

The proposition to require graduation in pharmacy as a prerequisite to examination by a board of pharmacy may be well enough in theory, but is far in advance of any recognized need for so radical a step.

Setting aside a limited number of pharmacies in the cities and large towns of the country, the remainder of the traffic in drugs, and the dispensing of medicines is accomplished by men without a high degree of scientific attainment, and who have small ambition to be classed with the learned professions.

In a broad sense the examinations given by boards of pharmacy are not such as to require a long course of training in the complex science of pharmacy in order that candidates may successfully pass them, and yet with a standard relatively low in a scientific sense the number of candi-

dates who fail to pass these examinations ranges from thirty to sixty per cent. with state boards having a maximum standard. What does this show? Plainly that the druggists with whom the great majority of these candidates have served during a longer or shorter period of apprenticeship have not had a scientific standard of qualification, for the reason chiefly that the necessity for such a standard was not apparent in the routine of every day drug store duties.

In the state of Ohio where the author is reasonably familiar with the varied phases of pharmacy as related to education and legislation, and where the requirements for registration are little, if any, below those of other states, the number of persons appearing for examination who have not graduated from schools of pharmacy about equals that of the graduates from those schools which are recognized as in good standing. The percentage of successful applicants in examination for first grade certificates has for several years averaged about fifty, showing that one-half of all those who desired to secure license to practice pharmacy were thought to be incompetent for such service. If the examinations had been made to conform to the ideas of the members of the board of pharmacy as to the knowledge which candidates for registration ought to be able to show before given the privilege to engage in the art, this percentage would probably have been materially reduced, and the number of successful candidates would not have been greater than one-fourth or one-third of those who applied for examination.

It must be borne in mind, therefore, that real progress toward fixed ideals is a tedious and ofttimes painful process; that the development of the art of pharmacy is only fairly begun; that this association is as yet the only organized representative body on the continent which is laboring for the scientific advancement of pharmacy; that boards of pharmacy and educators in pharmacy are still engaged in pioneer work; that the higher standards are to be reached through the evolutionary methods, an evolution which must begin with the people, and through them affect their representatives in legislative assemblies. In addition to this there must be a revolution in the minds of those men engaged in the art of pharmacy as to the necessity for the broader training of their assistants, and last but not least a revolution in existing methods whereby pharmacy has been made a department of bazaar shops.

Until these or some of these conditions are realized it is folly to argue for such lofty requirements as will impede rather than advance the progress of pharmacy toward what we must hope is to be its ultimate goal.

Profound respect should be shown those men who are eagerly advocating such methods as in their opinion will place the art of pharmacy upon a higher plane. They have ideals toward which they are sincerely laboring, and without ideals there is little real progress in human affairs. But they, with their admirers, should remember that ideal conditions are not

attained by legislative enactment. It is the existing order that laws follow in the wake of progress, and he who seeks to reverse this order will labor toward retarding rather than hastening the object of his ambitions.

## PRACTICAL EDUCATION.

BY JOHN F. PATTON.

It was a happy thought that prompted the merging of the Sections of Education and Legislation into one. They fit well together, seeing that their results are equally problematical. Education is a hackneyed phrase, and if it is designed to include the whole course of training, moral, intellectual and physical, it opens up a field bounded only by the past, present and future of the human race.

This Section, however, is, so I apprehend, concerned more with that line of education applying directly to a knowledge of pharmacy and its allied branches. As the force of legislation is determined by the impartial execution of the law, so education is to be measured by the receptive mind into which the seed of truth may fall.

In this age of specialization, the pharmacist in his training must be confined to well defined lines of means to an end, and that suggests the practical, as the subject for our consideration.

It was sound judgment that dictated the apprenticeship system in handcraft, supplemented by several years of experience for the apprentice as journeyman or traveling workman, before being permitted to engage in business on his own account. We find the best mechanics among those who have been thus trained.

One of the marked changes to be noted in the evolution of pharmacy is the doing away with the old-time drug store apprentice. The youth of good family and fair education who once sought the drug store as the field of his operation is no longer in evidence. He who has ambition to forge ahead in the race of life finds other fields more promising that that of pharmacy.

Many of the present day occupations hold out alluring promises of high position and rich rewards to the earnest young man, but the retail drug business is not of that class. The fact does not, however, lessen the *number* of those who desire to engage in it, but it *has* filled our colleges with would-be pharmacists of inferior grade as regards their intellectual and business capacity.

We have heard for years the complaint and protest of our pharmaceutical teachers against the poor material out of which they are expected to construct pharmacists, and the blame is placed on the poor judgment of the employer for permitting such incompetents to enter the fold.

Revolutions may be arrested, but they never turn backwards. So it is not unreasonable to prophesy that our schools will continue to have presented to them the same low quality of material of which we now hear the

complaint. Raising the standard of admission is the only hope, but that means less students and fewer schools.

The education of the pharmacist along the old lines may seem to us antiquated and inefficient, just as the trend of events would seem to point to a lessening need of education, in that he is becoming more and more the mere distributing agent of the manufacturer.

However we may differ about methods of education, we will all agree that that course of training which best fits a man to serve his fellow-men in any special calling is the one most earnestly to be sought. It has been said that the end of education is life, and the object of life is service. As compensation is the reward paid to service, the higher the service the greater the compensation.

"Knowledge is power," but it is an utterly useless asset unless employed for some one's benefit. Usefulness then is the basis upon which our claim for existence must be founded, and all education that tends to this end may be regarded as practical.

## ON THE PROBLEM OF PROPRIETARY AND TRADE NAMES.

BY M. I. WILBERT, PHILADELPHIA.

Of the several perplexing problems connected with the introduction and sale of the so-called new remedies, the proprietary right vested in the trade names is probably the most important. From the manufacturer's point of view, the coining of a conveniently short and easily remembered name is second in importance only to the fixing of a selling price that is sufficiently high to insure a liberal profit, after allowing for the necessary expenditures for salesmen and advertising.

The justice and importance of this, from the manufacturer's point of view, must be conceded. With him it is a business venture pure and simple, and he is lawfully entitled to all profits that may accrue to him. Without going into any further discussion of the problem from this point of view, it may be well to bear in mind that there are several kinds of proprietary rights in trade names. These may be defined as moral and legal.

If, for instance, a manufacturer in putting out a new or old compound chooses to coin for it a new name or title, this name or title is morally his property, and is usually considered as such. If however he, in addition, registers the same, as prescribed by the patent or trade-mark laws of the country, he has a legal right to the sole use of such title or name, and can restrain any and all persons from the use of such word, name or title.

The nuisance arising from this self evident right is that we, particularly in connection with the medical and pharmaceutical professions, are being overwhelmed with a multitude of meaningless and in many cases misleading names. Many of these names are dangerously similar, and are likely to lead to serious misunderstanding and possibly fatal mistakes. The in-

justice to the public, as well as the pharmacist, is evidenced by the unnecessary duplication of names and titles for substances or mixtures that are not themselves covered by patents.

As an illustration of how this duplication of titles may be abused, we may cite the substance that is chemically known as hexamethylene tetramine. This is being sold and used quite extensively under different trade names. These we will say are A, B, C, and D. If a pharmacist receives a prescription for hexamethylene tetramine as C, even if he has A, B and D in stock, he is morally not allowed to dispense either of them, despite the fact that he knows they are chemically identical. Nor would it be likely to avail him much if he were to ask the physician who wrote the prescription for permission to substitute A, B, or D for C—the reason for this being that the agent for C has but recently visited the physician and has assured him that C is the original and only genuine preparation; its use is never followed by any untoward results, and it has in addition many and decided advantages over the numerous base and worthless imitations that the unscrupulous druggist is always ready to substitute for it. So that there is nothing left for the druggist to do but to lay in a stock of C, and thereby complete his line of this particular chemical, until some other enterprising manufacturer chooses to put the same thing on the market under still another name or title.

This is but one of dozens of similar instances that could be quoted, but is sufficient to call attention to the possibilities that may arise from this one particular phase of proprietary names. It is difficult indeed to suggest a remedy for this evil. Personal interviews on the part of the pharmacist subject him to being accused of being interested in one or the other of the cheaper preparations or substitutes. Some joint action on the part of the different National Associations might be feasible, but even this could hardly be made binding on their members. In the meantime there is probably nothing to do but to give the subject as much publicity as possible, with a view of calling attention to the injustice done to the public, and the actual menace that the practice must necessarily be to progress along professional lines.

# MINUTES

OF THE

# COMMITTEE ON HISTORICAL PHARMACY.

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FIRST (AND ONLY) SESSION—TUESDAY EVENING, AUGUST 4, 1903.

The first session ever held by the new Committee on Historical Pharmacy was called to order in the Casino of the Grand Hotel at 8:30 p. m., with President Payne in the Chair.

Mr. Edward Kremers, Chairman of the Committee, read the following address:

## REPORT OF THE HISTORICAL COMMITTEE.

The general interest in the history of American pharmacy manifested at the Philadelphia meeting, caused some of the members of this Association to consider the desirability of perpetuating this interest, if possible, both for the benefit of this Association, and of the profession it represents.

It was thought best by some, that, inasmuch as the proposed work was of the nature of an experiment untried by this Association, a committee might best be appointed. If successful, the committee might later be transformed into a permanent section of the Association.

The resolution creating this committee reads as follows:

"Moved by the Council to recommend to the Association that a standing committee on historical pharmacy be established, to hold one public meeting annually, the committee to consist of a chairman and secretary to be named by the President of the Association, and such members of the Association as the chairman of the committee may select."

On December 22, 1902, the Chairman was informed of his appointment by President Payne. In a letter dated May 1st of this year, he was advised that Mr. E. J. Kennedy had accepted the secretaryship of the committee.

Previous to the second appointment, and in accordance with the instructions embodied in the resolutions adopted by this Association, the Chairman consulted in person and by letter those persons who had been instrumental in securing the passage of the above resolutions, also several other members of the Association living in sections of the country not then as yet represented.

For reasons that will become apparent from other portions of this report, it was thought best to select a large committee. While the Chairman has had able counsel in

the selection of this large and representative committee, he does not venture to flatter himself that it cannot be strengthened in the course of time.

A copy of the appended circular, which is an invitation to membership, and also contains suggestions for immediate work, was sent to each person whose name appears on the circular, also to the editors of pharmaceutical journals.

Many of those invited not only accepted membership, but expressed their hearty co-operation and even enthusiasm. There are, however, a number of vacancies which should be filled at this meeting. Suggestions, therefore, will be gratefully received.

Before discussing the work to be undertaken by the various sub-committees, it seems desirable to point out that, notwithstanding the shortness of the time between the issue of the circular and the calling of this meeting, the following valuable papers have been received, in the order given:

1. M. I. Wilbert—Daniel B. Smith, the First President of the American Pharmaceutical Association.
2. A. E. Ebert—Historical Sketch of the Chicago College of Pharmacy.
3. A. B. Prescott—Silas H. Douglas as Professor of Chemistry and Pharmacy, Before the Establishment of a School of Pharmacy in Michigan.
4. J. U. Lloyd—History of Echinacea Angustifolia.
5. W. C. Alpers—Justus von Liebig.
6. H. B. Mason—Detroit's First Pharmacy.
7. H. M. Whelpley—Gastric Digestion and Wm. Beaumont.
   Professor Wm. Procter's Prescription File for 1847–8.

In addition, the Chairman has the following papers to present, viz.:

1. Early Pharmacy in New France, in co-operation with Miss Helen Sherman.
2. Death and Dr. Hornbook.

To return now to the work of the sub-committees, the first mentioned in the circular, namely, the one on "Retail Druggists and Drug Stores," is, at the present stage of our historical studies, possibly the most important. It is desired that, in the course of time, the places on this committee be filled by the names of men who can do and are doing the greatest good by rousing a State interest in the history of their calling.

Since 1898, the Wisconsin Pharmaceutical Association has been doing pioneer work along this line. The year mentioned was the fiftieth anniversity of the statehood of the Badger State, and gave rise to a number of movements, all of which had as their object the study of State history and the development of such centers and collections as might further such study. At the Green Bay meeting of the W. P. A. an historical committee was appointed, which received each year a small sum of money—about $25.00—to defray the necessary expenses, principally express and freight. This committee has within the past five years accumulated not far from two thousand objects of historic interest to Badger pharmacists, which are being housed in the new and handsome home of the Wisconsin Historical Society.

One of the principal objects of the Wisconsin committee is to secure material for the equipment of a historical drug store representing the period 1848 to 1898. This is no longer a dream, for such a drug store is now being constructed from fixtures, bottles and apparatus and books collected from the eight hundred drug stores within the borders of the State of Wisconsin. The photograph of one of these sections, as preliminarily arranged, accompanies this report.

According to journalistic rumor, similar collections have been started in Michigan and Iowa. There is no reason why each State of the Union and each province of Canada should not begin work along similar lines.

Another State undertaking that appears to be restricted thus far to Wisconsin is the publication between two covers of everything pertaining to the pharmacy of one State. A copy of the "Badger Pharmacist," which accompanies this report, and which has

been edited and published by the pharmacy students of the University of Wisconsin, shows what can be accomplished in this direction. The volume is far from being perfect, and is lamentably deficient in the chapter devoted to retail pharmacists, a defect, however, less due to the student-editors than to the druggists themselves, who could not be prevailed upon to supply in due season the information asked of them. At the time of publication it was intended that the book should be a quinquennial, and it is to be hoped that some of the defects of the first volume may be remedied by the enlargement of the second edition.

Numerous other possibilities in the direction of state activity might here be enumerated. Were it not better for the present to call attention to a few accomplishments rather than a host of schemes.

One additional thought, however, should find expression at this time. Should the dream of some of us, viz.: a national pharmaceutical museum and library at Washington ever be realized, these State collections, if properly looked after now, will become the natural feeders of our national museum in the future.

### II. LOCAL ASSOCIATIONS.

Mr. Ebert, of the Veteran Druggists' Association of Chicago, has set an excellent example in showing what interesting and valuable results can be accomplished by continued painstaking study and research of local newspaper files and by a never-ceasing personal correspondence. It takes enthusiasts to persevere in such work. Several interesting papers are promised for the next following years.

There are a number of local associations that have played and are still playing an important role in American pharmacy. Many of them have been parents of State Associations, and some are to-day important factors in pharmaceutical State politics. Their history should be carefully written up, not from memory of one individual, but from documents.

### III. STATE ASSOCIATIONS.

In order to emphasize the importance of collecting documents, permit me to call attention to the fact that a large number of State Associations have not even preserved official copies of their own proceedings. Their proceedings are absolutely necessary for the purpose of writing the history of each State Association. Active members of State Associations are often ignorant of past Association events of greatest importance. Even if files of the proceedings are kept, the facts are buried in twenty or more numbers, often without an index.

In this connection it may be stated that the Lloyd Library is making extraordinary efforts to complete its files of the various State Pharmaceutical Association proceedings with a view of a complete record being presented to our Society by John Uri Lloyd next season. It is proposed that this paper shall give the details of each Society, and be accompanied by a list of all the papers on pharmacy that have been presented in America, thus furnishing students and others a ready guide to what is now in reach of no one person. It may be added that a President of one of the State Pharmaceutical Associations recently was compelled to visit this library in order to obtain data concerning his own State Society, the Lloyd Library having a complete set of which his own state was defective.

The commercial and professional experiments that have been tried by a dozen Associations in the country must, of necessity, be of interest to other State Associations. To what extent have these experiments been carefully studied and comprehensively written up for the benefit of others? Each Association goes on its way and benefits but little by the experience of others.

### IV. NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

The close relationship existing between the commercial interests of our State Associations and the several attempts that have been made to organize the retail druggists of the United States, renders it unnecessary to point out specifically what may be done by this sub-committee. A single question may serve as a suggestion: Where and by whom are complete files of the proceedings and transactions of the several National Associations of Retail Druggists kept, so that they can be consulted by a student of pharmaceutical economy?

### V. AMERICAN PHARMACEUTICAL ASSOCIATION.

The question has been asked, since the admirable address of Dr. Frederick Hoffmann, What can be done in the way of furthering the history of the Association? Much indeed, and Dr. Hoffmann would be the first to support such an assertion.

Who, *e. g.*, has ever collected the personal letters and other documentary evidence that is necessary to demonstrate the influence this Association has exerted on the formation of State Associations, on pharmaceutical education, etc.? Again, what is the inside history of our Commercial Section and its ups and downs? Short biographical sketches of our deceased members have been completed by our late Secretary of the Council, but in spite of the large amount of labor they represent collectively, our Proceedings still want a detailed account of the life and labors of our first President.

### VI. WHOLESALE DRUGGISTS.

At the time of the hundredth anniversary of their business, the house of Schieffelin & Co. issued a very attractive brochure. It is true that no other wholesale drug firm of to-day can point back to so long a period of existence, but their histories are not neces sarily less interesting or instructive. We need a history of the individual firms, past as well as present. Then a history of the wholesale drug business as such can be written, but not before. Those who are not given to writing, can at least collect catalogues and price-lists which will be of the greatest importance in writing the future history.

### VII. MANUFACTURERS.

No country has witnessed such a development in pharmaceutical manufacturing as has the United States. Fragmentary histories of firms have occasionally been written for special editions of our trade journals, but no systematic attempt has been made to collect the historical facts connected with individual firms. The mere compilation of a few dates concerning the establishment of firms is in no sense a history of this important branch of American pharmacy.

The tablet, *e. g.*, is a comparatively recent form of medication, but who has attempted to write its detailed history? Tablet machines that were used five and ten years ago have found their way to the waste pile, or have been remodeled into new machinery and have been invariably lost. Possibly not even the designs according to which they were made have been preserved.. Such is making history at a lightning rate, but unrecorded will not assist the future historian.

It is true that the manufacturer is unwilling to make public much of his legitimate private information, but he might preserve many documents and turn them over to our national museum when he has no further use for them.

Again, every one can contribute by the donation of old price-lists and catalogues, and even bills. No one can tell the value of a print, even an advertisement. Recently a very important patent decision rested on the testimony offered in an old advertisement preserved in the Lloyd Library. The early record of many drugs is only to be obtained from advertisements. On a formula discovered in an ephemeral receipt book of 1857, in the Lloyd Library, rest three important patent claims now under controversy.

VIII. LEGISLATION.

Much valuable work has been done by this Association and some of its members; also by State and local associations with reference to pharmaceutical legislation. Attention may here be called more particularly to the papers of Professor Beal, some of which approximate the point of view of the historian. Most of his papers, however, as well as those of many other writers, have in view future legislation rather than the study of the development of past legislation.

These remarks are not made by way of criticism of work done, but simply to point out that the historical plan has not been developed as it ought to be. It is not only of interest to study the past tendencies of pharmaceutical legislation in the several States, and the conditions that influenced these tendencies, but it is of great importance as well. Only he who knows the past can intelligently look into the future, for that future will be influenced by the past as certainly as it evolves out the past.

An attempt to prepare a documentary account of local pharmaceutical legislation will be found in a pamphlet entitled, "The Development of Early Pharmaceutical Legislation in Wisconsin." This shows how local pharmaceutical conditions were modified by immigration from Germany, how the German pharmacists who first attempted to regulate their calling by importing, with little change, German laws, failed; how the American pharmacists, many of German descent, succeeded; and finally, how the local law, after several years of operation, was displaced by a State law.

This otherwise insignificant account shows not only what can be done by the study of newspaper files and city documents, but, what is far more important, it clearly demonstrates the necessity for study of those documents and their collection and compilation in order to get at a true interpretation of events. It also shows that the study of laws and of documents relating thereto may prove of greater interest than merely the technical reading of law.

XI. STATE BOARDS.

The writer knows of no complete collection of the reports of the numerous state boards of this country. They certainly should be collected. Some of our journals have from time to time published the questions of our state board examinations, and occasionally a writer publishes some questions with his sarcastic comments and ridicule. But who has ever made a thorough, systematic study of these examination questions and of the method of examination in general? This cannot be done until the necessary material for such a piece of research has been brought together. Neither has anyone looked up the educational history of the men who compose and in the past, have composed these boards in order to ascertain their fitness for the positions they have held and hold. The books of the secretaries of these boards, containing the minutes of their meetings, should be collected, for they are documentary evidence of the greatest importance to the future historian.

X. ADULTERATION.

The historians of our Association have informed us that the immediate cause of the organization of the A. Ph. A. was the poor quality of drugs and chemicals imported. Last year, at our fiftieth anniversary meeting, a government official informed us that the subject of adulteration was still of such importance that the United States Government saw fit at last to take a hand in the matter.

German pharmaceutical papers recently announced the gift by Bruckner, Lampe & Co., of Berlin, to the new Pharmaceutical Institute of the University at that city, of a collection of nearly four thousand specimens of drugs. This collection was pronounced as being of special value, because it contained all of the forms of adulteration that had come under their observation during a business career of seventy years.

The speaker is aware of valuable collections of drugs at some of our pharmaceutical

colleges, schools, and manufacturing laboratories, but where are the valuable collections of drug adulterations that might have been made if the organizers of this Association had coupled with their crusade against adulterated drugs the task of collecting all forms of adulteration as a most important contribution to future students of this subject?

### XI. JOURNALISM.

Not many years ago the veteran pharmaceutical journalist of this country compiled an account of pharmaceutical and chemical journals that has often proven of value to persons engaged in bibliographic research. A detailed history of all of the American pharmaceutical journals would be of interest to many, even though of but little immediate practical value. Professor Henry Kraemer, the editor of the oldest pharmaceutical journal of this country, is collecting material of historical interest. At the Philadelphia meeting he exhibited some of the manuscripts of the contributors to the American Journal of Pharmacy. Let other editors follow the good example.

### XII. LITERATURE AND LIBRARIES.

It is not necessary to call the attention of our A. Ph. A. audience to the Lloyd Library. Some of us are also familiar with the somewhat extensive pharmaceutical libraries of the Philadelphia and New York colleges and of the Universities of Michigan and Wisconsin.

While we need more well-equipped college libraries to serve local interests, we need a national pharmaceutical library. A pharmaceutical department in the Medical Library of the Army and Navy cannot satisfy us.

It is not impossible that the Lloyd Library may some day become a national institute, for that library is to be donated intact to the furtherance of American pharmacy and research. If we desire to see it such, we should do something more than merely sit by and calmly observe the development of things.

### XIII. DRUGS AND MEDICAL PLANTS.

The discovery of the new world created an interest on the part of the inhabitants of the old world in the medical plants of the western continent and in the drugs derived therefrom. At the time of the celebration of the four-hundredth anniversary of the discovery of America, it was a German scientist who wrote a book on the history of American drugs and their significance in modern materia medica.

Your Chairman is not unaware of the pioneer work done in the study of the history of American drugs by Professor Lloyd, and occasionally by others. Much, very much work, however, remains to be done. To mention only an instance of very modern history, Who, *e. g.*, has traced the passing of the drug collectors of the Mississippi valley and the valleys of its tributaries? Who has mapped, year by year, the disappearance of the plant yielding cascara, due to the ravages of drug collectors that exceed any instance of reckless deforestation known to the speaker?

The latter illustration calls to mind the attempts that are now being made by the Department of Agriculture to cultivate medicinal plants and scientifically to cure drugs. This is valuable, and will afford material for the future historian, material that is being preserved carefully at Washington. But who has ever written an account of the numerous private attempts that have been made all over this country? In his own State, the speaker can point to a farm which for fifty years has supplied Parisians with oil of wormwood for their national beverage, and yet the only meagre historical account of this industry thus far published is to be found in a newspaper.

### XIV. EDUCATION.

Last, but not least, we have the work of the sub-committee on education to consider. Suggestions appear to be superfluous, for this work has already made a good beginning. Professor Prescott will present an interesting account of early pharmaceutical education

at the oldest State university, at a time when Michigan had not an organized school of pharmacy. Mr. Ebert, for a short period a professor at the Chicago College of Pharmacy, will present a sketch of the life-history of that institution. Next year, I trust, we may have many more papers of a similar nature. Attention may also be directed to the work of Professor Scoville as Secretary of the American Conference of Pharmaceutical Faculties.

Basal work of this kind is needed before the history of pharmaceutical education in this country can be written. In addition to these papers and compilations, we need files of catalogues on colleges and schools. Old lecture note-books, accounts of individuals while at college, contributions of old diplomas, matriculation cards, etc., call for the activity of others than college professors.

Other phases of pharmaceutical history might be mentioned. The development of this work will no doubt necessitate the creation of other sub-committees. Even the work outlined for the various sub-committees already in existence had to be exceedingly fragmentary, and could be merely suggestive. The right men will ultimately be found for the right places, and then the work will go on without further suggestions.

From the foregoing, the inference may be drawn that what we most need at present is the collection of documentary material. To write history may be a grander undertaking than the mere collection of building material for the future structure, but for some time to come that is impossible. We can do little more now, and do it well, than prepare for the future.

Your chairman is highly gratified to be able to report the willingness of the authorities of the Lloyd Library to co-operate with the American Pharmaceutical Association in the collection of such documentary material. The Lloyd Library is at present the most valuable pharmaceutical archive this country possesses. Students of pharmaceutical history or drug records must consult this library for much material not to be found elsewhere.* It will be a great convenience, therefore, to be able to house in the new edifice on Plum St., Cincinnati, such documentary material as we may be fortunate enough to collect, and have it at the command of students. Other objects of historic interest, such as wares, bottles, etc., etc., had best be housed in connection with state historical collections. When we are ready for a national pharmaceutical museum we can call upon these state repositories for their contributions.

The writer cannot close this rather lengthly report without calling attention to the impetus which the study of pharmaceutical history has received everywhere in connection with a similar interest that is spreading even more rapidly in the related profession of medicine.

Not only are there museums in Nürnberg (for Germany), and Zürich (for Switzerland), but local museums are springing up. A joint museum for medicine and pharmacy exists in Marseilles and a "historische Apotheke" was recently dedicated to the public in the city of Hannover, Germany. Other places might also be mentioned.

In medicine, the interest awakened in history has been decidedly conspicuous, as is witnessed not only by the establishment of museums at Nürnberg and elsewhere, but by the establishment of courses on the history of medicine in European and American universities, also of not less than three journals devoted to the history of medicine and cognate science.

May the movement started at our semi-centennial meeting grow to such an extent that its influence will be felt throughout every province and state of this North American

* To show this fact. Last month an eastern manufacturer, wishing to prepare a monograph on a special drug, sent an expert to Cincinnati to get his data. What was his surprise to find that to go through the volumes the Lloyd's handed him as vital to the work, would require weeks.

continent. Nothing will serve better to offset the present commercial tendency which manifests itself in pharmacy of to-day, not only in this country, but everywhere. It is useless to deplore this, but we ought not to neglect any step that will assure a harmonious and comprehensive development of that calling which we all love and to which we are devoting our lives.

### The Lloyd Library.

#### AN ADDENDUM TO THE CHAIRMAN'S REPORT.

As a report to the American Pharmaceutical Association, whose membership is so interestedly concerned in this library, it may be stated:

During the past year greater advances have been made in certain lines than ever before within the same period of time. The work of card-cataloguing the library is progressing rapidly, as is the alphabetical list of wants for future purchases, which includes every book-title attainable in its field. When these are finished, the librarian will have at his command:

1. A perfect shelf list of books, pamphlets, journals and prints of all kinds, bound and unbound, in the library.

2. A list of all books attainable that have ever been published, together with the different editions of each. This embraces every title in the field of the library attainable from catalogues in Europe and America, and from library and other lists.

During the past year the direct effort has been to complete serial pharmaceutical publications, State pharmaceutical, agricultural and horticultural proceedings, Government and State prints concerning botany, agriculture and allied sciences and connected pamphlets; proceedings of academies and societies, foreign and American, etc. In this we have been very successful; but yet many needful numbers are missing, and some sets are sadly defective.

We especially desire missing numbers of the above publications, and prints of all kinds relating to pharmacy, such as price-lists, catalogues, announcements, reprints, journals, State proceedings, both of societies and pharmacy boards, etc. The more ephemeral a print, the more necessary that it should have a recorded place on our shelves. Please do not destroy a pamphlet, catalogue or print without first dropping us a card giving its title. A better plan is to mail it directly to the Lloyd Library.

In order to show the scope of this library, it may be said that over 600 periodicals and proceedings of societies and academies reach its shelves regularly (exclusive of U. S. P. Government reports). A professional librarian, Captain Wm. Holden, with the necessary assistants, attends promptly to every inquirer, and gives attention to whomsoever wishes to consult its contents.

Let us close by thanking pharmacists generally for their attentions the past year. Many have been the miscellaneous collections of books, pamphlets, price-lists, journals, etc., received by us from pharmacists whose thoughtfulness we very much appreciate. Let us hope that to the many who have consulted the library, we have returned a share, at least, of these appreciated kindnesses.

Respectfully,

John Uri Lloyd,
*for The Lloyd Library.*

Cincinnati, August 1, 1903.

(Copy of Committee's Circular.)

American Pharmaceutical Association.

HISTORICAL COMMITTEE.

Madison, Wis., *June, 1903.*

*Dear Sir:* You are hereby invited to accept membership on the Historical Committee

created by the American Pharmaceutical Association at its semi-centennial meeting at Philadelphia last September.

The resolution creating this committee reads as follows:

"Moved by the Council to recommend to the Association that a standing committee on historical pharmacy be established, to hold one public meeting annually, the committee to consist of a Chairman and Secretary to be named by the President of the Association, and such members of the Association as the Chairman of the committee may select."

President Payne has informed the undersigned of his appointment as Chairman of this committee and of Mr. E. J. Kennedy as Secretary.

After consultation with some of the older members of our Association who were instrumental in the establishment of this committee, it was thought best to ask as many as possible of those who are interested in the history of American pharmacy, be it in one aspect or another, to co-operate in making this new line of association activity a success. If successful it will ultimately prove one of the most interesting sections of our annual meetings.

For the present the following sub-committees are to be provided for and the gentlemen, whose names are attached, are, hereby, invited to accept membership in the respective sub-committees. Kindly advise the undersigned at your earliest convenience of your acceptance if possible. He will also be pleased to receive suggestions as to additional lines of work and to receive the names of members of the A. Ph. A. especially suited to do some kind of historical work. As soon as the committee has been organized, suggestions for work that can be accomplished before the meeting at Mackinac Island will be submitted.

Respectfully yours, EDWARD KREMERS.

I. RETAIL DRUGGISTS AND DRUG STORES.

By states and provinces, as follows:

Alabama—P. C. Candidus, Mobile.
Arizona—H. Brisley, Prescott.
Arkansas—W. L. Dewoody, Pine Bluff.
California—J. G. Steele, Cordelia.
Colorado—C. M. Ford, Denver.
Distr. of Columbia—O. Schreiner, Washington.
Connecticut—C. A. Rapelye, Hartford.
Delaware—H. K. Watson, Wilmington.
Florida—G. W. Fisher, De Land.
Georgia—R. H. Land, Augusta.
Idaho—D. E. Smithson, Emmett.
Illinois—C W. Grassly, Chicago.
Indiana—L. Eliel, South Bend.
Kansas—L. E. Sayre, Lawrence.
Kentucky—J. W. Gayle, Frankford.
Louisiana—A L. Metz, New Orleans.
Maine—W. F. Jackman, Orono.
Maryland—J. F. Hancock, Baltimore.
Massachusetts—J. S. Orne, Cambridgeport.
Michigan—A. B. Stevens, Ann Arbor.
Minnesota—C. T. Heller, St. Paul.
Mississippi—J. W. Eckford, Aberdeen.
Missouri—W. K. Ilhardt, St. Louis.
Montana—H. Rockefeller, Butte.
Nebraska—A. V. Pease, Fairbury.
Nevada—W. A. Brown, Winnemuca.
New Hampshire—A. P. Preston, Portsmouth.
New Jersey—G. M. Beringer, Camden.
New Mexico—C. A. Portman, E. Las Vegas.
New York—E. J. Kennedy, New York City.
N. Carolina—E. V. Howell, Chapel Hill.
N. Dakota—H. E. White, Jamestown.
Ohio—W. R. Ogier, Columbus.
Oklahoma Ter.—F. M. Weaver, Oklahoma City.
Oregon—L. Blumauer, Portland.
Pennsylvania—J. H. Redsecker, Lebanon.
Rhode Island—M. B. Wood, East Providence.
S. Carolina—C. P. Aimar, Charleston.
S. Dakota—D. F. Jones, Watertown.
Tennessee—E. A. Ruddiman, Nashville.
Texas—E. G. Eberle, Dallas.
Utah—F. J. Hill, Salt Lake City.

Vermont—C. Blakely, Montpelier.
Virginia—T. R. Baker, Richmond.
Washington—H. T. Cummings, Tacoma.
W. Virginia—W. H. Williams, Wheeling.
Wisconsin—H. G. Ruenzel, Milwaukee.
Manitoba—C. Flexon, Winnipeg.
Nova Scotia—F. C. Simson, Halifax.
Ontario—John A. Clark, Hamilton.
Quebec—H. Willis, Quebec.

II. LOCAL ASSOCIATIONS.

A. E. Ebert, Chicago, Ill.
A. Tscheppe, New York City.
V. Coblentz, New York City.
H. B. Mason, Detroit, Mich.
Wm. McIntyre, Philadelphia, Pa.

III. STATE ASSOCIATIONS.

W. C. Alpers, New York City.
H. M. Whelpley, St. Louis, Mo.
L. C. Hopp, Cleveland, O.
J. L. Lemberger, Lebanon.
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IV. NATIONAL ASSOCIATIONS OF RETAIL DRUGGISTS.

T. V. Wooten, Chicago, Ill.
J. W. T. Knox, Detroit, Mich.
S. N. Jones, Louisville, Ky.
W. C. Anderson, Brooklyn, N. Y.
F. W. Meissner, La Porte, Ind.

V. AMER. PHARM. ASSN.

C. Caspari, Jr., Baltimore, Md.
S. A. D. Sheppard, Boston, Mass.
C. L. Diehl, Louisville, Ky.
E. L. Patch, Stoneham, Mass.
A. P. Sharp, Baltimore, Md.

VI. WHOLESALE DRUGGISTS.

W. J. Schieffelin, New York City.
J. McKesson, Jr., New York City.
A. Plaut, New York City.
C. F. G. Meyer, St. Louis, Mo.
M. N. Kline, Philadelphia, Pa.

VII. MANUFACTURERS.

J. Helfman, Detroit, Mich.
A. R. L. Dohme, Baltimore, Md.
E. H. Squibb, Brooklyn, N. Y.
A. B. Lyons, Detroit, Mich.
J. K. Lilly, Indianapolis, Ind.

VIII. LEGISLATION.

J. H. Beal, Scio, Ohio.
F. G. Ryan, Detroit, Mich.
F. E. Stewart, San Francisco, Cal.
C. S. N. Hallberg, Chicago, Ill.
A. B. Huested, Albany, N. Y.

IX. STATE BOARDS.

J. Calvert, San Francisco, Cal.
H. M. Whitney, North Andover Depot, Mass.
E. B. Heimstreet, Janesville, Wis.
J. B. Bond, Little Rock, Ark.
F. B. Lillie, Guthrie, Oklahoma.

X. ADULTERATION.

L. F. Kebler, Washington, D. C.
W. A. Puckner, Chicago, Ill.
R. Fischer, Madison, Wis.
F. A. Sieker, New York City.
C. H. La Wall, Philadelphia, Pa.

XI. JOURNALISM.

F. Hoffmann, Berlin, Germany.
H. Kraemer, Philadelphia.
C. A. Mayo, New York City.
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XII. LITERATURE AND LIBRARIES.

J. U. Lloyd, Cincinnati, O. ———
F. B. Power, London, England. ———

DRUGS AND MEDICINAL PLANTS.

H. H. Rusby, New York City. ———
J. O. Schlotterbeck, Ann Arbor, Mich. ———

EDUCATION.

A. B. Prescott, Ann Arbor, Mich.
J. P. Remington, Philadelphia, Pa.
W. L. Scoville, Boston, Mass.
J. M. Good, St. Louis, Mo.
W. M. Searby, San Francisco.

SUGGESTIONS FOR WORK.

The time before our annual meeting is too limited to do any exhaustive historical research, yet every member can contribute something along one of the lines to be suggested below.

While historical monographs are the greatest need at present, in order that the future historian may be enabled to write a comprehensive history of American pharmacy in all of its aspects, erudite treatises of this kind will scarcely command general interest on the part of the membership of our Association. However, objects of historic value will interest every one who loves our calling, as was demonstrated last September at Philadelphia.

We ought, therefore, to look forward to the establishment of a national pharmaceutical museum at Washington. It will take years before such an institution can be realized, yet the only way to effect its organization in a not distant future is to begin the work of collecting now.

It is in this connection that every member of the committee can do something at once. Let, *e. g.*, every member of the first committee send the photograph of one of the oldest druggists of his state, with a biographical sketch, or of a drug store with its history, or of some historical feature concerning pharmacy of his section. Photographs and manuscripts are less bulky than most other objects of historical interest and can be stored away more conveniently.

The Committee on Journalism might collect files of all American pharmaceutical journals and write up the life-history of each journal in the course of several years. A skeleton history has already been compiled by Dr. Hoffmann, which can be added to at once.

The Committee on Pharmaceutical Literature ought to secure copies of the minutes of proceedings of all the revision committees of the U. S. P., and gradually compile succinct accounts of the work of each committee. A bibliography of criticisms of the various editions might be undertaken in the course of time.

As Secretary of the American Conference of Pharmaceutical Faculties, Prof. Scoville has begun the compilation of titles, etc., of the various educational institutions. This work might profitably be extended so as to show the development of curricula, etc. Complete files of catalogues ought to be collected immediately.

Local associations are playing an important role at present and have always exercised considerable influence. Mr. Ebert is doing pioneer work in writing the history of one of these associations. Let others follow the good example, and, like Mr. Ebert, they will soon neglect their business occasionally in order to dig some historical fact out of the files of local newspapers.

In 1893 Prof. Whelpley compiled a brief history of all the state associations. Complete files of the proceedings of all state associations will be necessary to extend this

work. Let all who can contribute copies to Prof. Whelpley as a beginning for the continuation of this work.

The above suggestions, which might be extended almost indefinitely, make it apparent that we all can contribute documents of some kind, be they photographs, journals, proceedings, books, price-lists, college or association programmes, newspaper clippings, etc. If the document is not self-explanatory, it should be accompanied by as full an account as possible.

It is also expected that some of the members will present important papers to the meeting. Those who have material for such a paper on hand, and who have time and inclination to write one, are not in need of suggestions. It is to be hoped that every one who has valuable historical information to be deposited in the Proceedings of our Association, will not wait until he is personally urged to do so.

The address just read was received with marked applause, and, on motion of Mr. Beringer, who had a second in Mr. Helfman, was ordered referred to the Committee on Publication.

The President explained that he had been asked by the chairman of the committee to preside at this session, upon the theory that it was really a part of the general session, but that he differed with the gentleman, and only took the chair at all because some one had to preside while the Chairman's address was being read, and that now he would surrender to Mr. Kremers, who was properly in charge of the session.

Mr. Kremers thereupon took the chair.

Mr. Lowe thought the Chairman, in his address, had apparently shown himself unacquainted with the work done by the Philadelphia College of Pharmacy along the line of historical research. He said the college had not been asleep, but had published a history of the institution, which was now in print. He also called attention to the exhibit made in Philadelphia last year of an old-time drug-store, which was now in the college, with its antique furniture.

The Chairman stated that in the beginning he had called attention to the impetus given the work in Philadelphia last year, and he had in mind the work done by the college as well.

MR. WHELPLEY: Mr. Chairman, you interested me by calling attention to a scrap book of photographs which I had prepared, and I suppose I will equally surprise you by passing around that scrap-book, which I placed in my trunk just before leaving St. Louis. These are only about half the photographs I have taken at the various meetings of the Association. I will further state that these are photographs which were originally mounted on cards and then soaked off, consequently they are not the best of prints in appearance; but I have the negatives and could make a complete set of new prints, that could be added to the museum collection, if it is desired.

MR. MAYO: I have no doubt that a number of the members have photographs that might be of present interest in connection with the Association. I took about fifteen or twenty on the trip across the Lakes, some years ago, between Buffalo and Duluth. I have some scrap-books, if you care for anything of that kind.

THE CHAIRMAN: The Chairman does not want to make the impression that he tried to cover all the work that has been attempted, nor to illustrate everything anybody

might do. I mentioned this scrap-book because it shows what can be accomplished by almost any member of this Association. The collection of such photographs will be of considerable interest. I know when this scrap-book was passed around last year it attracted as much interest as any one historical document at the Philadelphia meeting.

MR. BERINGER: I want to correct, or rather extend, the remarks of Mr. Lowe. The Philadelphia College of Pharmacy had no committee for that purpose previous to last year, but they have now a new committee which has taken up the work outlined by the Association last year, and are prepared to collect all matters relating to pharmacy, manufacturing, retail and wholesale, and to collect the history of all members actively engaged in the establishment of colleges, and also the history of all the graduates in the institution. That work is now in progress.

MR. SHEPPARD: The question of the value and interest of a scrap-book, as shown by Mr. Whelpley, brings to my mind a scrap-book which I formed twenty-eight years ago as Local Secretary of this Association when the meeting was held in Boston, and it seems to me that the local history of our various meetings could from this time on be very easily collected, if our sub-committee would take that matter up. I was surprised when I came to put the material together in 1875 what an amount of interesting matter was collected. I started in with the newspaper accounts, and then followed right along to the end of the meeting. And some three years ago, when the Boston Druggists' Association was twenty-five years old—the meeting in Boston being the beginning of the Boston Druggists' Association—that Association wanted this scrap-book as a part of its early history. I collected it merely as a matter of interest at the time, but when it was twenty-five years old it was so interesting to the Boston Association that they considered it one of the most important items in the history of their life, because of the collection it gave: and if the Local Committee each year will collect all the facts connected with that particular meeting—if we do that year after year—we will have a history of local affairs at each meeting which will be surprising in the years to come.

MR. WHELPLEY: At the St. Louis meeting of the American Pharmaceutical Association, Mr. Sheppard, in conversation, gave me practically the same information that he has furnished here; and acting on that information I at once set about saving everything I could find pertaining to the St. Louis meeting; and after being elected President at that time I continued to save official correspondence and other matter relating to the Association, and I have this preserved, with the view of having the sheets bound into books that can be presented to the museum or library. I should judge that the sheets at the present time would make something like a volume of three thousand pages, so you can realize what there is to be gathered in connection with the meetings of the Association.

THE CHAIRMAN: I trust that the sub-committee will not forget these gentlemen in this connection.

MR. CLIFFE: In regard to the preservation of records of legislative matters referred to in the report, the Pennsylvania Association at its last meeting directed a complete compilation of the legislative records of the State affecting pharmacy to be made, showing everything that has been done in a legislative way affecting the drug business from the early Colonial period down to the present time; and it is presumed that will be ready next year.

MR. SAYRE: I simply rise to say that I have an interest in this work, and I should be very happy to co-operate in it. I have material relating to the early history of pharmacy in Kansas, which I think you will find very interesting, indeed. I promise you if I am here next year to read a paper on that subject—the early history of pharmacy in Kansas.

THE CHAIRMAN: I hope you will read such a paper at Kansas City next year.

MR. MAYO: Would it be out of place to propose that the committee invite the members to send prints of any photographs they may have relating to meetings in the past? They might do that at once. Each of us has one or two or more, probably. I would make that in the form of a suggestion.

MR. KEBLER: As to the matter the Chairman spoke of relative to the collection and preservation of adulterated drugs, I would like to say that the samples that were out at St. Louis are at present in the archives of the Smith, Kline & French Company. I have asked for them for the Drug Laboratory at Washington, but the members of the firm seem to be slow to present them to us, thinking probably that we might use them for some purpose that would injure them. Of course no such use would be made of them, and I intend again to present the matter to them and endeavor to get these drugs, and keep them at some place that may be set apart for this purpose. I am sure they will be given to us in the end, but they are a little bit afraid of us now. These samples are representative articles that I have examined for eight or ten years past, and I kept them in the first place as curiosities. I never dreamed having them for an exhibition similar to the one at St. Louis. I intend to ask Mr. Patch to present the matter to them again, and ask for them. I don't think they will ever make use of any of them.

Relative to the matter touched on regarding the pharmaceutical library at Washington, we are sorely in need of such a library. I thoroughly appreciate the spirit shown in that paper. We should have the best pharmaceutical library at Washington. We need so many books there now. I am constantly wanting volumes that just happen to be out. It is always the one you want that seems to be missing. I also want to say that it seems to be the prevailing opinion that we can get anything we want—that the Government has lots of money. That is a mistake. When I first arrived in Washingten I immediately found that there was a great need of pharmaceutical publications. I spoke to Dr. Wiley about it, and he told me to make out a list of what we wanted immediately. I made out a list of about twenty different current periodicals. The matter was sent to the Librarian, and then went through the hands of the regular committee, and we were allowed *two* out of the twenty on our list for one year. After that I talked the matter over again with Dr. Wiley, and we decided to write to a number of the journals of the country and ask them if they would not exchange their journals with us for the report we intended to get out. Of course, that put a large responsibility upon the Chief of the Drug Laboratory, but personally I was willing to take the responsibility, and a number of them responded, and I want to thank them for it. We would also like to have, if any of the members of this Association can give them to us, any old journals you can find; you may have some portions of old journals that would make up a set. We also want to make up a complete set of proceedings of each State pharmaceutical association, and I am sure that there are a great many in this Association that have numbers in their old files they do not care for. I hope they will send them to the Librarian at Washington, in care of the Agricultural Department, and we will most gladly receive them.

MR. GORDON: I mentioned to Mr. Oldberg the proposition that a history of the druggists and pharmacists in the army and navy might be of interest to the Association. If so, I have access to all the data, and will be glad to work it up. I think we can make quite an interesting history in connection with the pharmacists in the military service.

THE CHAIRMAN: We should appreciate the information. Anything you can collect will be acceptable.

The Chair then called for the reading of a paper by Mr. Ebert, of the

Chicago Veterans' Association, entitled "An Historical Sketch of the Chicago College of Pharmacy."

Mr. Ebert was greeted with applause as he came forward to speak, and the first thing he did was to pass around some photographs, old catalogues, matriculation cards, etc. He then prefaced the reading of his paper by the statement that the Chicago Historical Society was exceedingly rich in documents before the great fire in 1871, and that after that great calamity the association appealed to the world for a restoration of its archives. This was accomplished in large part, but unfortunately this second collection was destroyed by fire in 1874. So in Chicago there is scarcely anything left, the best information obtainable of the early history of Chicago being found in the Wisconsin Library and the Milwaukee papers and Peoria papers. He said some of the older druggists conceived the idea of restoring the history of the drug trade as fully as might be, and they set about it: it is not so difficult if you are persistent. The first drug store in Chicago was in 1832. "The city of Chicago was born in a drug store," he declared. They had been at this collection for seven years now, and believed they had a record of every drug store in business in Chicago from 1832 to 1871—up to the fire. They had collected the names of about two thousand persons who had been in business, including clerks employed by them. Although it may seem a difficult task to make such a collection, with the records burned, persistence will discover some member of the family, and by writing you can make up the facts. Out of ten stores in Chicago in the thirties, they had collected the history of nine—all but one; and so on for the other years. The intention was, to write a history of the firms, and the style of business they carried on, and also to enumerate the clerks and give a biographical sketch wherever possible—that is, of those prominent in the management of the business. While all this seems to require a great deal of labor, yet it had been found very interesting.

Mr. Ebert then read his sketch, of which the following is an abstract:

## ABSTRACT OF HISTORICAL SKETCH OF THE CHICAGO COLLEGE OF PHARMACY.

BY ALBERT E. EBERT.

Historian of the Chicago Veteran Druggists' Association.

With the organization of the American Pharmaceutical Association in 1852, a powerful impetus was given the cause of pharmaceutical education in this country, for from its very beginning this Society urged the necessity of providing for the education of the rising generation of pharmacists, by the establishment of schools of pharmacy. At that period there were but two schools of pharmacy in the country, namely, those of Philadelphia and New York. A few years later the Maryland College of Pharmacy instituted a course of lectures, but until 1859 there existed no school of

the kind in the West, for the Cincinnati College of Pharmacy, founded some years previously, had as yet exercised no teaching functions.

In 1857 several pharmacists of Chicago joined the American Pharmaceutical Association, and through the interest thus aroused there resulted an effort to organize the druggists of Chicago, which culminated in a meeting held September 5, 1859. At this meeting a society was organized and subsequently incorporated, bearing the name of "The Chicago College of Pharmacy."

One of the first steps taken was the establishment of a School of Pharmacy, and in November of the same year a course of lectures was instituted and was continued until the spring of 1862, when the war caused the suspension of the teaching.

The first class numbered about 40 students in attendance, and at the close of the term two graduates were presented.

Immediately after the close of the war, the college was re-organized and teaching was resumed, and continued up to the time of the great fire, when all its equipment, library and property of all kinds were consumed. But the pharmacists throughout the world, and especially those of Great Britain, led by Messrs. Attfield, Ince and Brady, contributed money, books, apparatus and supplies, and the institution was again re-established and placed upon a firmer footing than before. So that in the fall of 1872 the School of Pharmacy resumed its teaching, which has since continued up to the present time without interruption.

The establishment of "The Pharmacist," a monthly journal published by the College from 1868 to 1886, did much to advance the interests of pharmacy in the West.

An invitation extended by the College to the American Pharmaceutical Association to meet in Chicago was accepted, and the seventeenth annual meeting of the Association was held in Chicago in August, 1869. The influence of this meeting was salutary and helpful to pharmacy and to the College, not alone in Chicago but throughout the West.

The twenty-fifth anniversary of the founding of the College was signalized by the completion and occupation of a new building in which ample space with superior equipment was provided, and the better accommodations and facilities resulted in better work. Laboratory courses in pharmacy, chemistry and vegetable histology were made obligatory. A laboratory devoted entirely to prescription compounding was established, which department received a medal and diploma at the World's Columbian Exposition for its excellence.

The college was formally turned over to the State of Illinois, and united with the University, May 1, 1906, and is now conducted as the technical "School of Pharmacy" of the University of Illinois.

In the management of the school the trustees and officers of the University have the assistance of an Advisory Board of Pharmacy, elected by the regis-

tered pharmacists of the State, through the Illinois State Pharmaceutical Association. In turning over to the people of Illinois the "School of Pharmacy," it is believed that the pharmacists constituting the organization have acted wisely, and that the trust reposed in them by their brethren throughout Europe and America has been faithfully discharged. We believe that the expectations of the founders of the Chicago College of Pharmacy have also been realized, as the institution has been an important factor in furthering not alone pharmaceutical education, but of promoting similar organizations throughout the central- and north-west of this country, and thus has added to the history as well as the general welfare of the profession of pharmacy in this country.

THE CHAIRMAN: Gentlemen, you have heard this interesting account of the first local organization in Chicago. What is your pleasure?

Mr. Lowe moved to receive and refer to the publication Committee. Mr. Helfman seconded the motion.

MR. EBERT: I am afraid if we should get together all these documents and try to publish them it would swamp the Association. They would become so voluminous we could not possibly do that. I think we may bring them together and present them, and at some future time make use of them. I don't think we ought to publish them now.

THE CHAIRMAN: The Committee on Publication will take care of that.

The motion to refer was then put and carried.

In the absence of the author, the Chair called on Mr. A. B. Lyons to read a paper on Silas E. Douglas, prepared by A. B. Prescott. The paper was read and was received with applause. On motion of Mr. Eliel, the paper was referred to the Committee on Publication. The following is the text of the paper in abstract:

## THE TEACHING OF CHEMISTRY AND PHARMACY AS RELATED SUBJECTS IN COLLEGES OF MEDICINE AT THE MIDDLE OF THE LAST CENTURY.*

BY ALBERT B. PRESCOTT.

[Abstract.]

It was the design of this paper to illustrate the inherent relationship between the science of chemistry on the one hand, and its manifestations in pharmacy on the other hand, by some historical notices of college teaching in Michigan, and throughout the United States, in the time of the fifties. In the committee work upon the proper curriculum of a medical college, undertaken by the American Medical Association directly after its organization, the teaching of pharmacy was strongly insisted upon, and the example of the Scottish universities was set forth in this particular. In

* Published in full in Pharmaceutical Review, Sept., 1903.

nearly half of the medical colleges of the United States the subject of pharmacy then received secondary mention in professional titles, either jointly with chemisty or with materia medica, for teaching in the lecture-courses. At the same time it was the special effort of the committee on medical education, referred to above, to institute laboratory methods of teaching in the medical colleges. In the medical college of the University of Michigan, the chair of chemistry was held by Silas H. Douglas from 1844 until 1877, and for the most of this period as professor of chemistry and pharmacy, this being the first instance of the teaching of chemistry in the state universities of the northwest. It soon became the main object of this man to provide laboratories for college students. The laboratory of chemistry was housed in a separate building in 1856. In this a laboratory course in pharmacy was organized in 1860, eight years before the establishment of a School of Pharmacy for the education of pharmacists in the same university. Even in the beginning of those laboratory exercises, such as the making of emulsions, the preparing essential waters and the division of metallic mercury in its several forms, in all these tasks the principles of solubility and of molecular aggregation as understood in the physical chemistry of that time, were brought into the personal discussions of the students with each other as they worked. The few manuals of pharmacy of the period were of lively interest. The pharmacopœia of 1860, in its four hundred small pages of large type, by virtue of its dignified brevity and reserve, gained the first place in the respect of the student. As an educational experiment the work gave proof of the significance of pharmacy in the study of matter itself, all the matter that is known to man.

Mr. Wilbert was called on to read a paper he had prepared on Daniel B. Smith, the first President of this Association, and he did so in abstract, being applauded when he had finished, the full text of the paper being as follows:

## DANIEL B. SMITH,

### The First President of the American Pharmaceutical Association; a Review of His Life and Achievements.

BY M. I. WILBERT, PHILADELPHIA, PA.

The first meeting of the American Pharmaceutical Association, held in Philadelphia, in 1852, was presided over by the best-known and most-highly-respected pharmacist in America at that time.

The life-history and character of this first president offer many points that are worthy of recording, with a view to bringing them to the attention of present and future generations of pharmacists. The early history of pharmacy in our country recounts the names and deeds of a number of broad-minded, unselfish and public-spirited men, who devoted a con-

siderable portion of their time and energy to secure for future generations the preservation and extension of the liberal ideas and high ideals embodied in the Constitution of the then-young republic.

For us, it is gratifying indeed to realize that pharmacy, even at that early period, could count among its votaries in this country men who should, and do, rank among the more advanced and scholarly of their times.

Among the more progressive and advanced of the early pharmacists was Daniel B. Smith, who was born in Philadelphia, July 14, 1792. His father, Benjamin Smith, died the following year, and his mother, a strict adherent of the Society of Friends, removed to her former home in Burlington, N. J., where the future President of this Association received his early education in the Friends' School, presided over by John Griscom.

After leaving school, still quite a boy, he was apprenticed to John Biddle, of Philadelphia, to learn the art, trade and mystery of an apothecary. After serving his time with Mr. Biddle, he was taken into partnership, the firm name appearing for a number of years in local directories as Biddle & Smith, Apothecaries, 182 High street (now Market street, between Fourth and Fifth).

About 1819. his connection with Mr. Biddle having been dissolved, Daniel B. Smith opened the store at the northeast corner of Sixth and Arch streets, that subsequently played so important a part in the development of scientific pharmacy in this country.

Mr. Smith had received a good preliminary education, and is said to have been a most systematic and devoted investigator and student. His life, as recorded in a sketch by one of his former apprentices, Mr. Charles Bullock,* presents two distinct phases that are particularly interesting and important.

In addition to being a pharmacist, advanced and progressive far beyond the requirements of his times, Daniel B. Smith was also a man, in the fullest, widest sense of the word. That he had the welfare of his fellowmen at heart, and was even willing to deprive himself of what might be considered his rights and privileges, to assist in promoting the welfare of others, is amply demonstrated by a review of the ideals and accomplishments of his early life. Looking back over the intervening period of time to the early years of the life of Daniel B. Smith, his character, divested of the natural weaknesses and shortcomings that are the necessary accompaniments of all mortals, stands out prominently for the interest that he took in the inauguration and subsequent advancement of institutions that have played no unimportant part in the general moral and material advancement of the community, and in the development of a feeling of self-reliance and general well-being in its citizens.

In this connection it may be of interest to enumerate a number of these

* A. J. P., 1883, page 337.

institutions, and to give their objective aims, with a view of illustrating the trend and ideals of our young philosopher. While it is true that many of these institutions are more or less local in their direct field of influence, several of them were the first of their kind in this country, and by being copied or followed in other cities or communities, have assumed a national importance.

The first institution that the name of Daniel B. Smith appears in connection with is the Philadelphia Savings Fund. This institution, moreover, has been most fruitful of good results, both directly as well as indirectly. The indirect good that it has accomplished, by fostering thrift and economy among a class of citizens that were proverbially shiftless and thriftless, is of even greater moment than the help and stimulus it has been to its more than 1,000,000 depositors.

Whether or not Mr. Smith was identified with this enterprise from its inception, in 1816, does not appear. His name does appear, however, in the list of managers for 1819, and reappears annually to 1835. He was, therefore, one of the managers when the institution was incorporated, in 1819.

The next institution in point of time was the Apprentices' Library. This was organized in 1820, through the personal efforts of three worthy Friends—Daniel B. Smith, Thomas Kimber and Samuel L. Shober. We of the present time can hardly realize how difficult it must have been for the studiously inclined apprentice of that period, with his necessarily limited means, to secure suitable reading matter. While it is true that there were a number of more or less successful public and semi-public libraries in Philadelphia in the early portion of the last century, this particular library was designed to, and did, fill a want not supplied by any of the older and more pretentious institutions.

It might be added that, despite the practical disappearance of the apprentice, the Apprentices' Library is still in existence, and is to-day one of the most popular and most frequented of the many libraries of Philadelphia.

The inauguration of the next institution in which Mr. Smith was interested is of more direct interest to us as pharmacists.

On February 21, 1821, a meeting of the apothecaries and druggists of Philadelphia and Liberties was held in Carpenters' Hall for the purpose of forming a society with the twofold object of affording systematic instruction to their apprentices and to subject themselves to regulations in their business.

The inaugural meeting was followed by a second, on March 21, 1821, at which the Philadelphia College of Apothecaries was formally organized, and the necessary officers elected. At this second meeting Daniel B. Smith was elected to serve as secretary. In the following year this society was incorporated as the Philadelphia College of Pharmacy, which, as you

all know, is still in existence. We shall have occasion to refer to this institution again, however, when we come to consider the career of Daniel B. Smith as a pharmacist.

In 1824 Mr. Smith was one of nineteen persons desirous of joining a society for the purpose of elucidating the history of the State, and in February of the following year, at the inaugural meeting, he was elected the first corresponding secretary of the Pennsylvania State Historical Society.

Another now well-known institution, that was organized in 1824, is the Franklin Institute of the State of Pennsylvania for the promotion of mechanic arts. As its name indicates, the object of this institution is to promote the various branches of manufacture and the mechanic arts by collecting and disseminating knowledge relating to them, and also by recognizing and rewarding deserving persons who have made useful inventions.

Of this institute Daniel B. Smith was a charter member, and while a resident of Philadelphia he continued as a contributing member, his name appearing as such until after his removal to Haverford.

In 1829 his name appears as one of the incorporators of "The House of Refuge." This was the second institution of the kind in America, the first having been opened in New York in 1825.

In 1830, Daniel B. Smith was instrumental in organizing, and was subsequently elected one of the trustees of Haverford College. This school is admittedly among the foremost in the country for the high standing of its literary as well as moral training. After the necessary buildings were completed the trustees had some difficulty in securing acceptable teachers for the different branches. Appreciating the necessity of securing teachers that were in accord with the ideals and needs of the institution, Daniel B. Smith willingly gave up the personal supervision of his flourishing business to accept the chair of Moral Philosophy and English in the new school, and continued as a teacher until the school was temporarily closed twelve years later.

His very excellent and highly-appreciated work as a teacher we cannot do more than refer to. Suffice it to say that in the very interesting and complete History of Haverford College* his work in connection with the school is duly and gratefully recorded.

When, in 1846, it was found that, owing to the continued financial depression, and the lack of attendance on account of the gradual decrease in the number of Orthodox Friends, the school was not able to pay running expenses, Daniel B. Smith was one of the first to suggest a change in the requirements for admission, and the raising of an endowment fund, that would insure the continuance of the school as a seat of learning for all time.

In addition to these institutions which Daniel B. Smith was interested in

* Published in Philadelphia in 1892.

at their inauguration, his name also appears as a member of the Philosophical Society in 1829, and as a member of the Academy of the Natural Sciences, although the latter he did not join until in later life he felt that he had sufficient leisure to devote to a more extended study of the branches of the natural sciences that he was particularly interested in, botany and conchology.

Probably the last society that Daniel B. Smith was prominently identified with at its organization was the American Pharmaceutical Association, and this, indeed, presents a fitting close to his long and active career as a pharmacist. For it cannot be denied that much of the credit for placing this Association on the high moral and ethical plane that it has always occupied, and of giving it the wide scope that it aims to fill, is largely due to the officer that presided at the National Pharmaceutical Convention at Philadelphia, in 1852, at which the American Pharmaceutical Association was instituted.

While the details of the discussions that took place at this inaugural meeting are unfortunately lost to history, sufficient of their drift is preserved in the printed proceedings of this first meeting, and in published expressions of opinion, to indicate that it was largely due to the intimate acquaintance that Daniel B. Smith had of the ideas, needs and wants of the pharmacist as a professional man that the American Pharmaceutical Association was inaugurated on the broad, liberal plan that provided for all that cared to take part in its proceedings.

To appreciate his action in this respect more thoroughly, we must review, if even in the merest outline, his previous connection with, and the part he took in, the development of professional pharmacy in his early life.

As noted before, Daniel B. Smith, in 1819, opened the store at the northeast corner of Sixth and Arch streets. This soon became recognized as one of the leading apothecary shops of the city, and was frequented by many of the more advanced physicians of the time. Its proprietor, Mr. Smith, soon acquired the reputation of being thoroughly reliable and trustworthy, and of having available a practically unlimited fund of informamation on all matters pertaining to his profession.

It need not surprise us, therefore, to find that his fellow-apothecaries were quite willing to, and did, appreciate his probity and ability by electing him secretary of the newly-organized College of Apothecaries.

The original minute-book of the college is still in existence, and bears witness to the care, neatness and ability with which Daniel B. Smith carried out the duties of this office.

A large measure of the success that has been achieved by the Philadelphia College of Pharmacy is no doubt due to the institution and continuance of the "Journal of Pharmacy." This venture was largely, if not entirely, due to the personal efforts of Daniel B. Smith. It was he who first

realized the importance and the necessity of introducing a journal, for the rapid dissemination of knowledge, as well as the instruction of the men actively engaged in their profession. This journal, the initial number of which was published nearly eighty years ago (1825), is still in existence. It has the proud distinction of being the oldest purely pharmaceutical journal printed in the English language, and is to-day the acknowledged leader in its particular field. As a professional journal, that has never been tainted by even a suggestion of commercialism, it is not excelled by any publication either in this country or abroad.

As noted before, Daniel B. Smith served the Philadelphia College of Pharmacy for seven years as secretary. In 1828 he was elected first vice-president, and the following spring, after the death of the president, William Lehman, was elected to that office, being the third president of the college.

He was re-elected annually until 1854, thus conducting the affairs of the institution through twenty-five of its most critical years, when, after the first enthusiasm and interest had waned, it met with, not alone neglect, but even opposition, from many of the local apothecaries.

Having the interest of the whole pharmaceutical profession at heart, Mr. Smith was naturally interested in the organization and progress of the College of Pharmacy of the City of New York, and repeatedly assured that institution of the moral support and good will of the Philadelphia school. That this was appreciated is evidenced from the fact that he was elected an honorary member of the New York college on March 21, 1839.

The part played by Daniel B. Smith in connection with our national standard, the United States Pharmacopœia, should not be forgotten. It was no doubt largely due to his deep interest in the style and content of this book, and the technical knowledge and skill that he displayed in the several criticisms, that pharmacists, as such, received the recognition that was rightfully due them. It will be remembered that the first edition of the United States Pharmacopœia was published in Boston, by authority of the National Medical Convention, in 1820.

The book itself was based on the previous edition of the Pharmacopœia of the Massachusetts Medical Society, and also the several Pharmacopœias that were published in Great Britain at that time. This first official Pharmacopœia was inconsistent in many respects, and contained a number of evident errors. One of the first official acts of the Philadelphia College of Pharmacy was to appoint a committee to inquire into, and to report on, this first Pharmacopœia. Daniel B. Smith, with William Lehman and Dr. Samuel Jackson, were appointed on this committee, and were directed to inquire into and determine to what extent the Pharmacopœia should receive the indorsement of the college.

The committee, at a subsequent meeting, made a lengthy report, in which they enumerated a number of evident mistakes in the contained

formulas, and also pointed out where other formulas differed from those generally in use in Philadelphia. The members of the committee further recommended that the committee having charge of the publication of the Pharmacopœia issue a corrected edition. The latter suggestion, it appears, was acted on, since a second edition, in which many of the more evident errors were eliminated, was issued in 1826.

When the committee in charge of the first decennial revision of the U. S. P. had completed their task, the manuscript, before being sent to the printer was submitted to the Philadelphia College of Pharmacy for review, and any necessary corrections. This task was delegated to a committee, of which Daniel B. Smith was chairman. This committee, after carefully reviewing the manuscript and making a number of valuable suggestions and corrections, recommended the adoption and use of the book by the apothecaries belonging to the college.

That the work done by the committee of the Philadelphia College was appreciated is evidenced by the action of the next decennial "National Medical Convention," at which the pharmacopœial revision committee was directed to consult with the authorities of the various colleges of pharmacy in existence at that time. This was subsequently done, and some very valuable suggestions received from the members and officers of the New York and Massachusetts Colleges. The suggestions and corrections offered by the committee that had been appointed by the Philadelphia College, and of which Daniel B. Smith was again chairman, were so numerous and so evidently in the nature of a necessity that the revision committee was practically compelled to rewrite the whole Pharmacopœia.

The National Convention of 1840 had provided for representation of of incorporated pharmaceutical colleges in the next revision. Appreciating the value of this recognition to the pharmaceutical profession, the Philadelphia College of Pharmacy, in 1847, appointed a committee to critically examine the existing Pharmacopœia, and to recommend the revision of such parts of the book as were found to be at variance with the facts and requirements of the time. Daniel B. Smith was again chairman, and the committee was to report at least six months before the time of the meeting of the national convention.

The work done by this college revision committee was quite extensive, and the resulting report was a voluminous one. It was entrusted to the delegates of the Philadelphia College of Pharmacy—Daniel B. Smith, Charles Ellis and Wm. Procter, Jr.—to be conveyed to the national convention, with the indorsement of the college.

It will be seen from this that the influence of Daniel B. Smith on the style and content of the early editions of the U. S. P. was not an unimportant one, and that he contributed materially to bring and to keep the early editions of the book in keeping with then-accepted facts and theories.

There is one other item of interest in connection with the introduction and popularizing of the early editions of the U. S. P. In 1830 Dr. George B. Wood, Dr. Franklin Bache and Mr. Daniel B. Smith agreed to compile and publish a commentary, with the avowed object of making the Pharmacopœia more generally known and acceptable, and thereby add to its more general recognition as the national standard.

Dr. George B. Wood, in referring to the inception and publication of the "United States Dispensary," said: "Daniel B. Smith had been singled out to co-operate in the work on account of his thorough acquaintance with pharmacy, both scientific as well as practical." After writing a number of articles, including a lengthy introduction to the pharmaceutical portion of the book, Mr. Smith found that the time required would materially interfere with a number of other duties, and consequently withdrew.

The literary and scientific worth of the articles he did contribute may be assumed from the fact that they reappeared, without material change, in a number of editions, and were not discontinued until, in one of the later editions, the whole work was practically rewritten and the contained material entirely rearranged.

Of Mr. Smith's other contributions to pharmaceutical literature, his "Principles of Chemistry," first published in 1837, although primarily intended for a text-book at Haverford College, not alone indicates great literary ability, but also evidences how thoroughly familiar he was with the principles of chemistry as they existed at that time. The third part of this book, consisting of an outline history of chemical philosophy, is particularly interesting, and well worth reading even at the present time.

Of his numerous contributions of the early numbers of the "American Journal of Pharmacy" it would be difficult, indeed, to say too much. They have ever been considered as having literary as well as scientific merit, and have done much toward establishing the high standard of excellence for which that journal has always been famed.

The store, at Sixth and Arch streets, deserves a more extended notice than could be devoted to it in a paper of this kind. Suffice it to say that it was generally considered one of the leading pharmacies, if not the leading pharmacy, in Philadelphia in its time.

About ten years after opening the store, Mr. Smith was fortunate enough to associate with him Mr. William Hodgson, Jr., a most accomplished pharmacist, and a one-time apprentice in the celebrated establishment of John Bell, London, England. After Mr. Smith accepted the chair of Moral Philosophy and English at Haverford College, much of the responsibility of the store necessarily devolved on Mr. Hodgson, who practically conducted the establishment from 1834 to 1846.

The official connection of Daniel B. Smith with the American Pharmaceutical Association was necessarily a brief one, but, short as it was, was important and fruitful of good.

The particular incident that demonstrated the necessity of some such union dates back some five years prior to the inauguration of the Association itself. The particular cause that led to this united action was the discovery made by some members of the New York College of Pharmacy that foreign, particularly English, manufacturers and dealers were making a practice of supplying inferior drugs and chemicals to different portions of the United States.

The agent of an English firm admitted that his house made a practice of supplying a different quality of drugs and preparations for the Atlantic cities from what was supplied for the trade in the Western States, the prices obtained for the former being from two to three times those obtained for the latter.

In 1847, the College of Pharmacy of the City of New York, to break up this nefarious traffic, instituted a systematic crusade against the admission of inferior and adulterated drugs. In this it received the hearty support of the Phildaelphia College of Pharmacy, of which Mr. Smith was the president and the leading spirit. In the following year (1848) the United States Congress passed an act providing for the systematic inspection of all consignments of drugs and chemicals at the different ports of entry.

The subsequent enforcement of this law was far from satisfactory, on account of the differences of opinion as to what constituted an inferior or adulterated drug. The National Pharmaceutical Convention, which met in New York in 1851, had for its object the discussion and, if possible, the establishing of certain standards for the drug inspectors at the several ports.

As is well known, it was at the second pharmaceutical convention, held in Philadelphia the following year, that the American Pharmaceutical Association, as it now exists, was formally organized. As noted before, many of the details of the discussions that took place at this inaugural meeting have been lost to history. From the published reports, however, there can be no doubt that it was largely due to the able management and wise counsel of Daniel B. Smith as presiding officer, that the make-up of the proposed association was changed from one of delegates of established colleges and societies to an open association of reputable pharmacists in which all could meet on common ground.

That this move was a wise one is more than satisfactorily proven by the flourishing condition of the Association at the present time, as well as its record and achievements in the past.

Under the new constitution, adopted in Baltimore, September 15, 1856, Daniel B. Smith was nominated and elected the first honorary member of this Association. He was also the last surviving of the honorary members elected at that time.

Mr. Smith retired from active business in 1853, the year after the inau-

guration of the American Pharmaceutical Association. He had removed to Germantown in 1849, and but a short time after this lost both his wife and his only daughter by death. His wife, a most estimable lady, had been a Miss Esther Morton, daughter of John Morton, a merchant of Philadelphia, and President of the Bank of North America.

The remaining years of the life of Daniel B. Smith were quietly spent in his home in Germantown, surrounded by his children and the children of former friends and associates.

He was fortunate enough to live to see the institutions that he had been interested in in his early life flourish and increase from their humble beginnings and become important factors for the welfare of his fellow-men.

The appreciation and regard that his contemporaries and students had for him is amply displayed in the pages of the history of Haverford College, and in the eulogy of Dr. George B. Wood, in his collection of medical addresses, first published in 1859. This latter, coming, as it did, from a man acknowledged to be in the front rank of the medical profession in America, is well worthy of reproduction:

"Justice requires that some allusion should here be made to the services of a gentleman to whom the pharmacy of this country is greatly indebted. I refer to Daniel B. Smith, formerly President of the Philadelphia College of Pharmacy. Standing among the first of the apothecaries of his time in literary and scientific attainment, peculiar skill in his art, and general reputation, he entered zealously into the movement which originated and sustained the College of Pharmacy; and by his own written contributions, the encouragement which he extended to the efforts of younger men, and the measures set on foot or ardently supported by him for the improvement, in various ways, of the professon to which he was attached, he contributed, I think, more than any other one individual to the impetus which has carried the pharmacy of this country to its present relatively high position." This testimonial, coming as it did while Mr. Smith was still alive, from one who had known him for nearly fifty years, and had been at times closely associated with him, must needs impress us at the present time with its sincerity and honesty.

Daniel B. Smith died March 29, 1883, in his ninety-first year, and was interred in the Friends' Burying ground, Germantown.

While his memory is cherished by the numerous institutions which he aided and fostered in his early days, his efforts to improve and to elevate the social standing of pharmacy should not be lost sight of.

This would appear the more necessary as with advancing years the ethical standing he occupied during his life is the more readily attainable, so that we are likely to forget, in considering the achievements and attainments of later workers, how much they, and we, really owe to the comparatively few public-spirited men who, with Daniel B. Smith, despite the opposition they encountered from their contemporaries, raised and main-

tained a standard of ethics and excellence which we to-day are vainly trying to excel.

As time passes on, the ideals and deeds of these early pharmacists will become more appreciated, and it is but just to the memory of Daniel B. Smith that his name should be properly identified with them.

Mr. Hancock, seconded by Mr. Voss, moved to refer the paper for publication.

MR. FENNEL: Mr. Chairman, I move to amend to refer with the positive direction that it be published in the Proceedings; I think that much is due, that we publish this sketch of the first President of the American Pharmaceutical Association.

MR. HANCOCK: Mr. Chairman, I have no objection to accepting the amendment if the Committee sees proper.

THE CHAIRMAN: If there is no objection, then, I will put the motion in this form: That it is moved and seconded that the paper be referred to the Committee on Publication, with the positive request that it be published.

MR. HALLBERG: Before that motion is put I would like to state that I think an obituary of Mr Daniel B. Smith appeared in the Proceedings some twenty-five years ago containing most of these facts, and why should they be repeated? Leave it to the Publication Committee. Let the Committee compare it with the obituary of Mr. Smith, and then if there is nothing in that let it be published in full.

The Chair put the motion before the house to a vote, and it was adopted.

The Chair stated that the next paper was of a biographical character also, and was upon Justus von Liebig, by Mr. W. C. Alpers. Mr. Alpers, before reading the paper,* made the following prefatory remarks:

*Mr. Chairman, Ladies and Gentlemen:* When the importance of the work of this Historical Committee became generally known, the suggestion was made that the Committee might extend its work also in the research of biography of such men as have been prominent in pharmacy and chemistry, even if they had not lived in this country, and in a tentative way I beg to introduce a paper on Justus von Liebig. It is more appropriate that we would do so this year, as it is the hundredth anniversary of his birth, and celebrations in his honor have been held by nearly every chemical society in this country.

Mr. Alpers, after reading his paper, proceeded to relate a few characteristic anecdotes of von Liebig, showing his manner of teaching, and his sensitiveness.

Mr. Ebert moved to receive the paper, and turn over to the Publication Committee. He said that what had been told of von Liebig and his relations with his students was quite characteristic of him. Mr. Ebert then went on to say:

I knew von Liebig well: he treated me nobly while I was with him. Prof. Remsen

* No abstract of this paper has been furnished.—THE GEN'L. SEC'Y.

was with me at the time. He was very positive in the way of assertion, that is true. He was one of the best of teachers; he was as clear as clear could be. He did not use any language that any body could not understand, and it was that great simplicity of the man that made him a great teacher; he used language that every body could understand, and his lectures were so simple that you could easily follow him. His experiments were most brilliant. There was nothing saved in the way of money in making his experiments; they were perfect.

Mr. Ebert then related an anecdote or two about von Liebig, and then continued.

I have been very much pleased to hear the paper that Mr. Alpers has presented; but I want to say that the American Pharmaceutical Association in 1873, at the time of the death of von Liebig, took recognition of his greatness. Then again in 1874, when we met in Louisville, Dr. Lawrence Smith, who also had been a student of von Liebig, came before the Association and appealed to us for a subscription for a monument; and I want to say on behalf and to the credit of the Association, we contributed liberally to that monument which was erected at Munich.

The Chair then put the motion to receive the paper and refer, and it carried.

THE CHAIRMAN: In connection with this paper on von Liebig I may state that I have in my room some thirty odd slides of portraits of von Liebig and the museums at Giesen and Munich, and the laboratories at that place, which I should have liked to show the audience if I had known the lantern would be here. I would like to have the names of the students of von Liebig at this place. I have received several and would like to know of others. Furthermore, I may mention that there is one of the old-time Liebig combustion furnaces in this country; it was used by Adam Conrath when a student at the Philadelphia College of Pharmacy.

The Chairman then indicated a paper by John U. Lloyd, giving a history, description and record of Echinacea angustifolia, which he said would be read by title only—the paper being passed around, with samples of the drug considered.*

Upon the request of the Chair, Mr. Harry B. Mason then presented a paper upon the early history of pharmacy in Detroit, of which the following is the text:

## DETROIT'S FIRST PHARMACY.

BY HARRY B. MASON.

The first distinctive pharmacy in Detroit was established in 1849. Before that time general stores handled drugs, much as they did groceries, but no prescriptions were dispensed, nor was there any element of professional or scientific skill involved.

To Dr. George B. Russel, one of the pioneer physicians of the town, who began practice as early as 1836, and who is alive and hearty at the re-

* This paper, which cannot be abstracted to any advantage, together with the specimens submitted, has been placed in the keeping of the Historical Committee.

markable age of eighty-eight—to Dr. Russel the city is indebted for its first pharmacy. In the days of the Doctor's early practice he was compelled to collect plants and make his own tinctures, extracts and the like. He had in his employ at this time a young man, Henry Simineau by name, in whom he became very much interested, and whom he himself educated, not only in the common English branches, but in Latin and the higher studies as well. Among other things, too, he taught Simineau to do his pharmaceutical work for him; and the boy finally became so skilled in it that the Doctor established him in the business in 1849, building a store and furnishing a stock. The location was 52 Jefferson avenue, and a prosperous prescription and drug trade was done here until 1852, when Simineau went further west and became markedly successful in the wholesale business.

This was the first opportunity which the Detroit physicians had of turning their strictly pharmaceutical work over to a specialist, and securing relief from the necessity and burden of doing it themselves. They relished the chance, for the most part, and thus were pharmacy and medicine divorced in Detroit, as they had been nearly seventy-five years before in the older cities of the Atlantic seaboard.

Upon motion of Mr. Hancock, the paper was ordered to take the usual course.

Mr. Whelpley, at the invitation of the Chair, then presented a paper upon "Gastric Digestion and William Beaumont," receiving the applause of his auditors. Mr. Whelpley exhibited the work of Dr. Beaumont on the subject of gastric digestion, containing a portrait of Alexis St. Martin, whose famous case is treated of, and called attention to the monument erected in the old fort at Mackinac by the Medical Society of Northern Michigan, to commemorate this wonderful case in medical history. The following is an abstract of the paper.

## GASTRIC DIGESTION AND WILLIAM BEAUMONT.*

BY H. M. WHELPLEY, PH. G., ST. LOUIS.

The stomach being the most dilated portion of the alimentary canal, must have attracted the attention of early anatomists. The food contents of the stomach often became apparent in bodies mutilated by accident or design. Thus we find the physiologists of the eighteenth century designating the stomach as the organ of digestion and devising many theories to account for the changes in food brought about by the gastric digestive process. The concoction, putrefaction, trituration, maceration, fermentation and cooking theories each had its day. But none stood the tests of time. While advanced thinkers could not substitute a more acceptable

* Printed in full in the Meyer Brothers' Druggist for September, 1903 (see pages 254–7).

theory, many of them doubted the old ones and felt like that Scotch anatomist, Wm. Hunter (born 1718, died 1783), who said, "some physiologists will have it that the stomach is a mill, others that it is a fermenting vat, others again that it is a stew pan; but, in my view of the matter, it is neither a mill, a fermenting vat, nor a stew pan, but a stomach; gentlemen, a stomach."

Then came the chemical solution theory, based upon experiments made by Reaumur, Spallanzani and Stevens, with gastric juice from human beings and lower animals. In 1752, Reaumur obtained gastric juice by swallowing a tube containing a sponge. The studies of Friedemann and Gruelin, and the identification of hydrochloric acid in the gastric juice by William Prout, in 1824, gave more definite information about the digestive fluid of the stomach than ever before.

In 1834, Eberle discovered that "something" about the mucous membrane of the stomach had a proteolytic action. In 1836, Schwann showed this "something" to be soluble, and not the mucus as suspected by Eberle. He called it pepsin, but did not isolate it. In 1839, Wassman obtained the soluble solid pepsin for the first time.

It was about 1820 that physiologists were feeling very irksome under the rule of the theories of digestion, and yearned for more definite information based upon rational experiments. It is true that various workers had studied the stomachs of dogs and pigeons during digestion. Ingenious persons had swallowed bags and frail wooden boxes of food (Spallanzani about 1790), or fenestrated silver hollow balls filled with meat (Edward Stevens, 1777), and attached to a string so that the container could be removed after a sojourn in the stomach, and the condition of the contents determined. On various occasions persons suffered wounds which left gastric fistulas and enabled the observers to look into the human stomach and see what was going on. But no practical experiments were recorded.

Thus the time was ripe for a golden opportunity which occurred on Mackinac Island, more than three-quarters of a century ago. On June 6, 1822, Alexis St. Martin, a twenty-five-year-old French Canadian was accidentally shot in the stomach with a shot-gun, the muzzle of which was only three feet from his body. Dr. William Beaumont, the surgeon of the fort, reached the patient within a few minutes after the accident.

After ten months the wound was partially healed. Dr. Beaumont received St. Martin into his family where he nursed him, gave him medical and surgical treatment for nearly two years, during which time the wound was dressed daily, and much of the time twice a day.

May, 1825, the wound had healed but left an opening into the stomach. Dr. Beaumont arranged with St. Martin to submit to a series of physiological experiments on gastric digestion. These extended, off and on, over a period of several years.

Alexis St. Martin was under Dr. Beaumont's care and study during four different periods. This enabled Dr. Beaumont to make 238 observations.

These were particularly directed to the phenomena occurring during digestion in the stomach. The precise mode of action of the gastric juice upon the various articles of food was determined. Careful attention was also given to the nature of the gastric juice and its action upon substances outside of the body. These experiments made possible and rendered in-


The above picture is from a photograph inserted in a copy of the first edition of Dr. Wm. Beaumont's work on digestion.

telligent the investigations by chemists and physiologists during the following years.

The following may be regarded as the most important of the results of Beaumont's observations:

1. The accuracy and completeness of description of the gastric juice itself.

2. The confirmation of the observations of Prout that the important acid of the gastric juice was the hydrochloric.

3. The recognition of the fact that the essential elements of the gastric juice and the mucus were separate secretions.

4. The establishment by direct observations of the profound influence on the secretion of the gastric juice and on digestion of mental disturbances.

5. A more accurate and fuller comparative study of the digestion in the stomach with digestion outside the body.

6. The rapid disappearance of water from the stomach through the pylorus, a point insisted on and amply proven by Beaumont.

7. The first comprehensive and thorough study of the motions of the stomach.

8. A study of the digestibility of different articles of diet in the stomach.

The wound in Alexis St. Martin's stomach healed in such a manner that a flap of skin completely covered the orifice when the stomach was in the condition of repose. St. Martin completely recovered from the three years' illness. He married and had four children, all of whom are still living.

In 1840 the Medical Society of London raised between $1,500 and $2,000 to induce St. Martin to come to England, but he was not located by those in search of him.

Alexis St. Martin died at St. Thomas de Joliet, June 24, 1880, aged eighty-three years. His family were determined that the medical profession should not secure his stomach. They kept the body exposed for four days in hot weather. They also had the grave dug eight feet below the surface of the ground in order to prevent an expected attempt at resurrection. Mrs. St. Martin, whose maiden name was Marie Joly, died April 20, 1887, at the age of ninety years.

Publicity was first given Dr. Beaumont's experiments by the publication of a series of observations in the "Philadelphia Medical Record," for January, 1825. In 1833 appeared an octavo volume of 280 pages entitled, "Experiments and Observations on the Gastric Juice and the Physiology of Digestion, by Wm. Beaumont, M. D., Surgeon-General in the U. S. Army." This was printed at Plattsburg, N. Y., by F. P. Allen.

In 1834, copies of the Plattsburg edition, printed by F. P. Allen, were issued by Lilly, Waite & Co., Boston. In 1838, Dr. Andrew Combe, of Edinburg, Scotland, issued an edition, with numerous notes and contents. The second American edition was issued from Burlington, Vt., in 1847. This was corrected by Samuel Beaumont, M. D., a cousin of the author. A German edition was published in 1834. Beaumont's papers were published in Paris, but there is no record of a printed edition of the book.

Dr. William Beaumont was born in Lebanon, Conn., November 21, 1785. When twenty-two years of age, he became a school-teacher at Champlain, N. Y., on the Canadian frontier. He next studied medicine with Dr. Benjamin Chandler, at St. Albins, Vt., and graduated at the Uni-

versity of Pennsylvania. In 1812, he was appointed assistant surgeon in the army. He had a long and interesting army experience, interrupted by four years in private practice at Plattsburg, N. Y. In 1834 he was ordered to St. Louis. In 1839 he resigned from the army and became a citizen of St. Louis, where he continued in practice until the time of his death, April 25, 1853.

Dr. Beaumont has been recognized, either directly or indirectly, in every book on physiology published since the announcement of his experiments. The medical profession of the northwestern peninsula of Michigan has erected a monument to his memory at Mackinac Island. St. Louis and other cities have medical colleges bearing his name. The surgeon-general's office at Washington contains carefully prepared records of his scientific work. He is looked upon as a pioneer physiologist of this country, and one who undertook as great scientific investigations as have ever been attempted in America.

MR. LOWE: I was under the impression that this accident occurred at a place on Lake Champlain, but it seems that it was right here at Mackinac. It was certainly providential to the human race that this accident happened, because all the available ways of learning how digestion is carried on had been exhausted, and we had come to our rope's end—gotten up to a blank wall. But when this accident happened, it opened up a wide field for investigation, and we learned a great many things we could not have learned in any other way.

Mr. Voss moved to receive the paper and refer, and the motion prevailed.

The Chair stated that Mr. Whelpley had a paper upon Prof. William Procter's prescription file for 1847–8 that he would present.

MR. WHELPLEY: I will say that when I attended the Philadelphia meeting of the American Pharmaceutical Association, at the suggestion of some of the members, and in company with some of them, I visited the store of William Procter, on Ninth and Lombard streets, I believe it is. While there I became interested in the prescription files, which were very extensive and dating back to the establishment of the store, and my interest was rewarded by the presentation of one of these files, which was given me by the present owner of the store. This file I took home to St. Louis, and have had lantern slides made showing the appearance of the file as it arrived and a number of the prescriptions afterwards taken from it. The prescriptions I am taking apart and pasting on paper, and I will then bind them in a volume, and next year I will bring them for your inspection. The prescriptions, many of them, are written on almost any kind of paper, whatever was most convenient, and scraps of paper seem to have been most convenient.

Mr. Whelpley then exhibited, with the aid of the lantern, a number of these prescriptions, selected for showing certain characteristics or peculiarities in their make-up, and some with changes made by Prof. Procter to correct errors or omissions.

Then followed a succession of portraits of honored and distinguished and deceased members of the Association, thrown on the screen from the the lantern, which were received with interest and favor.

The Chair then presented the following abstracts of the two remaining papers, after which the Committee on Historical Pharmacy adjourned.

## "DEATH AND DR. HORNBOOK."

BY EDWARD KREMERS.

An historico-critical discussion of Burns' poem, parts of which are frequently quoted as representative of the condition of pharmacy in Scotland at the close of the 18th century.

The paper may appear in full in the "Pharmaceutical Review," before the close of 1903. E. K.

## EARLY PHARMACY IN NEW FRANCE.

BY HELEN SHERMAN AND EDWARD KREMERS.

A preliminary account, based largely upon documentary material recently published in the "Jesuit Relations," and thereby made generally accessible. The thesis for the bachelor's degree by Miss Sherman is deposited in the Library of the University of Wisconsin.

Chapters are devoted to "Louis Hébert," the first permanent settler, who was a pharmacist; to "Robert Giffard," a surgeon; to "The Hospitals of New France," viz.: those of Quebec and Montreal; to the "Jesuit Apothecaries," Charles Boispineau and Jean Francois Parisel; to "Native Drugs;" and the "Drug Lists of the Hospital of Quebec."

The "drug lists" are the want lists of European drugs, with the quantities needed, and are, therefore, very instructive of the conditions of early materia medica (1664–1669) in this province.

Possibly Miss Sherman can do more work on this interesting subject during the coming academic year, in which case a detailed account may be published in the "Pharmaceutical Review." E. K.

# ENTERTAINMENTS AT THE FIFTY-FIRST ANNUAL MEETING.

Owing to the peculiar location of Mackinac Island, the place of meeting, the entertainments were chiefly confined to such pleasures as were offered by Dame Nature at this most charming lake resort. The historic associations added much to the enjoyment of the week's sojourn.

On Monday, August 3d, at 8:30 p. m., a social gathering was held in the Casino of the Grand Hotel, with music and refreshments in abundance, which afforded a delightful opportunity for the renewal of old and the making of many pleasant new acquaintances.

A carriage drive around the island had been arranged for Wednesday afternoon, which, together with the numerous daily trips on foot, enabled every one to become well acquainted with the many points of interest, including the historic old fort, which at different times had afforded shelter and defense for French, British and American troops, and is now used as a public park, where stands the monument erected by the physicians of Michigan to the memory of Dr. William Beaumont, of Alexis St. Martin fame; also the old Mission House and Church, the American Fur Company's Headquarters, now used as a hotel and known as the John Jacob Astor House; Fort Holmes, the quaint town of Mackinac, and the beautiful walk along the beach. Among the natural attractions must be named the Arch Rock, Sugar Loaf Mountain, Lover's Leap, Skull Cave, where Alexander Henry was kept concealed by his Chippewa friend Wáwátan for several days, and thus saved from death; the Devil's Kitchen and Chimney Rock.

Thursday evening, August 6th, the members and their ladies were treated to a very interesting lecture, illustrated by stereopticon views, by Dr. H. M. Whelpley, the secretary of the Council, on the Indian Sacred Red Pipe-Stone Quarries of Minneseta. Dr. Whelpley having recently visited these famous quarries, and himself taken the numerous pictures exhibited, was in a position to entertain his listeners in a most pleasing manner.

On Friday afternoon a delightful boat-ride, tendered the Association by the management of the Grand Hotel, took place on the lake, and included a visit to St. Ignace, on the mainland, where many visited the grave and scenes of labor of that intrepid explorer and missionary, Father Marquette, who was buried in the village churchyard in 1677.

Mackinac Island, originally known as Michilimackinac, is situated at the

Lake Huron end of the Straits of Mackinac. It is an ideal place for asso-sociation meetings, having excellent hotel accommodations and a delightfully cool climate, besides many miles of well-kept roads for driving and a splendid boulevard along the beach, extending about nine miles around the island. The Association would do well to select this resort again for its annual meeting within the next five years, as every one present felt well repaid for the visit, and all sessions were well attended.

A noteworthy incident of the meeting is the fact that all expenses of the entertainments were paid out of the receipts from the sale of coupon tickets, besides leaving a nice cash balance to be turned into the treasury of the Association. Many thanks are due Mr. F. W. R. Perry and his associates for the excellent management of this part of the meeting. The local secretary's financial report to the Council will be found below.

C. C. Jr.

## REPORT OF THE LOCAL SECRETARY.

*To the Members of the Council of the A. Ph. A.:*

The undersigned begs leave to submit the following report of cash received and disbursed at the fifty-first annual meeting, held at Mackinac Island, Mich., August 3–10, 1903:

RECEIPTS.

| | |
|---|---|
| From sale of 182 Coupon Entertainment Books, at $2.50 | $455 00 |

DISBURSEMENTS.

| | |
|---|---|
| The Whitehead & Hoag Co., 400 badges | $112 75 |
| Wolverine Printing Co., 400 coupon books | 18 50 |
| J. J. Lodge, stereopticon | 38 61 |
| Grand Hotel, refreshments | 50 00 |
| Grand Hotel—livery, $123.00; music, $8.65 | 131 65 |
| Express, freight cartage, livery porters | 18 00 |
| Postage | 1 00 |
| Typewriter | 1 50 |
| Expense Local Secretary trip "Soo"—Mackinac Island (June 18th) | 5 35 |
| Telephone to Detroit | 1 00 |
| R. R. Certificates (2) | 50 |
| Expenses of Local Secretary at meeting | 30 61 |
| Exchange | 25 |
| Grand Hotel, livery | 4 50 |
| Exchange | 18 |
| Balance (Cash remitted to Treasurer) | 40 60 |
| | $455 00 |

F. W. R. PERRY, *Local Secretary.*

Detroit, Mich., *Oct. 1, 1903.*

# REPORT

ON THE

# PROGRESS OF PHARMACY.

From July 1, 1902, to June 30, 1903.

By C. Lewis Diehl.

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## INTRODUCTORY.

It may be remembered that in his admirable review of the "endeavors" of the so-called "International Pharmaceutical Congresses," referred to in the introductory to last year's report, Dr. Frederick Hoffmann expressed the opinion that these congresses were in no respect international except in name; that they had accomplished nothing of practical or tangible benefit towards the unification of formulas, and that it was to be hoped that when the last congress adjourned at Paris, in 1900, it was to be *ad infinitum*. In common with progressive pharmacists throughout the world, Dr. Hoffmann doubtless keenly felt the failure of these congresses—which have met nine times at irregular intervals since the first meeting in 1865 and have accomplished so little—and in consequence he was led to pronounce the severe judgment mentioned. It is all the more gratifying, therefore, to note that the outcome of these congresses has not been as barren as might be inferred from Dr. Hoffmann's conclusions, for there is little doubt that the

"*International Conference for the Unification of Formulæ of Potent Medicaments*" is the direct successor of the so-called "International Congresses," and that the "International Conference," held at Brussels, September 15–20, 1902, *did* accomplish something that is both practical and tangible towards the unification of formulæ—if, indeed, only for the formulæ of potent medicaments—as is evident from the report of its transactions by Dr. Frederick B. Power, who, together with Dr. Horatio C. Wood, represented the United States at that memorable Conference. He says that this Conference was quite distinct in character from the various International Pharmaceutical Congresses that have preceded it,

although it was a development of them. It was international not only in name, but in fact, the delegates from the following countries represented having been appointed by their respective governments: Austro-Hungary, Belgium, Bulgaria, Denmark, France, Germany, Great Britain, Government of India, Italy, Luxemburg, the Netherlands, Norway, Russia, Sweden, Switzerland and the United States of America. The chief and most important distinction of this International Conference from the congresses hitherto held—the last at Paris in 1900—was its restriction to the consideration of plans for securing international uniformity in strength of potent remedies only. As a result of this limitation of its scope it is believed to have satisfactorily accomplished its task, and to have achieved a measure of success which was not possible with that wider range of discussion which had characterized and rendered ineffective all preceding pharmaceutical congresses. The initiative for convening the Conference at Brussels proceeded from the Paris Congress in 1900, and was based upon a proposition offered by Professor Tschirch, representing Switzerland, which, as finally adopted, was as follows:

"To have a comparative table prepared showing the difference in strength of medicaments bearing the same name in different pharmacopœias. To have this table distributed to the pharmacopœia commissions, to the academies of medicine and the pharmaceutical colleges and associations of the various countries, with the request to take this matter into due consideration at their next pharmacopœia revision, and to adopt, so far as possible, a uniform standard of strength, and where differences still remain, to call attention to such in foot-notes."

In accordance with this proposition the Conference formulated certain recommendations, which were finally adopted in three articles.

*Article I* enumerates a list of potent medicaments, which should receive uniform Latin designations, and should be prepared in accordance with the directions placed opposite their names. The list includes the following: Aconite (tuber) and tincture; belladonna (leaf), tincture and extract; colchicum (seed) and tincture; digitalis (leaf) and tincture; ipecacuanha (root), tincture and syrup; hyoscyamus (leaf), tincture and extract; nux vomica (seed), tincture and extract; opium, three tinctures (simple, crocata and benzoica) and Dover's powder; ergot, solid and fluid extract; dilute hydrocyanic acid; cherry-laurel water; bitter-almond water; phenol solution; sodium arsenate; arsenical solution (Fowler's); syrup of ferrous iodide; tincture of cantharides; tincture of iodine; tincture of lobelia; cocaine hydrochloride; mercurial ointment, and antimonial wine.

*Article II* recommends that "in future the following principles should be observed:"

(*a*) A potent medicament should not be prepared in the form of a medicinal wine.

(*b*) Tinctures of potent drugs should be made of 10 per-cent. strength, and by percolation.

(*c*) Fluid extracts of potent drugs should be of 100 per-cent. strength.

*Article III* states that "it would be expedient to adopt a normal drop counter, of which the external diameter of the dropping tube should be exactly 3 millimeters. In other words, at a temperature of 15° C., and with distilled water, 20 drops should be equivalent to 1 gramme."

It is impracticable to call attention to the numerous subjects that came under discussion without going into greater detail than is warranted for this report. Suffice it here to say that the results of this conference have been most favorably criticised, and it is the consensus of opinion that they will in time lead to a complete realization of the ideals of its promoters (Amer. Journ. Pharm., Jan., 1903, 1–13).

In this connection the following

*Table Showing the Proposed International Standards of Potent Medicaments*, compared with preparations now official in various National Pharmacopœias, will prove interesting. This table has been furnished by Mr. M. I. Wilbert, and accompanies a critical review of the work accomplished by the Brussels Conference. The figures give the percentages:

| | International. | U. S. P. | British. | German. | French. | Russian. | Austrian. | Italian. | Spanish. | Portuguese. | Belgian. | Dutch. | Danish. | Swedish. | Swiss. | Greek. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tincture of Aconite .... | 10 | 35 | 5 | 10 | 20 | 10 | 10 | 10 | — | 20 | — | 10 | — | — | 10 | |
| " " Belladonna .. | 10 | 15 | 6 | — | 20 | 10 | 10 | — | 20 | 20 | 20 | 10 | — | — | 10 | |
| " " Cantharides.. | 10 | 5 | 1.25 | 10 | 10 | 10 | 10 | 10 | — | 10 | 20 | 10 | 10 | 10 | 10 | 16.5 |
| " of Colchicum Seed ..... | 10 | 15 | 20 | 10 | 20 | 10 | 10 | — | — | 20 | 20 | 10 | — | 10 | 10 | 16.5 |
| Tincture of Digitalis .... | 10 | 15 | 12.5 | 10 | 20 | 10 | 10 | 10 | 20 | 20 | 20 | 10 | 10 | 10 | 10 | 16.5 |
| " " Hyoscyamus . | 10 | 15 | 10 | 10 | 20 | — | 6 | — | 20 | 20 | 20 | 10 | — | — | — | 6.5 |
| " " Iodine ..... | 10 | 7 | 2.5 | 10 | 7 | 10 | 6 | 8 | 6 | 10 | 8 | 8 | 5 | 5 | 8 | 5 |
| " " Ipecac ..... | 10 | — | — | 10 | 20 | 10 | 10 | — | 20 | 20 | 20 | 10 | — | 10 | 10 | |
| " " Lobelia ..... | 10 | 20 | 20 | 10 | 20 | 10 | 10 | 10 | — | 20 | 20 | 10 | 10 | 10 | 10 | |
| " " Nux Vomica . | 10 | 16.5 | 10 | 10 | 20 | 10 | 10 | 10 | 20 | 20 | 20 | 10 | 10 | 10 | 10 | |
| " " Opium ..... | 10 | 13 | 7.5 | 10 | 15 | 10 | 10 | 10 | — | 5 | 8.4 | 10 | 10 | 10 | — | 16.5 |
| " " Opium Camphorated ..... | 0.5 | 0.52 | 0.46 | 0.5 | 0.45 | 0.5 | — | — | — | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Tincture of Strophanthus. | 10 | 5 | 2.5 | 10 | 20 | 10 | 10 | 5 | — | — | — | 5 | — | 10 | 10 | |
| Syrup of Ipecac ..... | 1 | 7 | — | 1 | 3 | 1 | 1 | 1 | 2 | 2 | — | 5 | — | — | 1 | 1.5 |
| Syrup of Iron Iodide.... | 5 | 10 | 7.3 | 5 | 0.5 | 5 | 5.5 | 0.61 | 0.67 | 0.49 | 0.5 | 5 | 10 | 10 | 1 | 0.005 |
| Hydrocyanic Acid, Dilute. | 2 | 2 | 2 | 2 | 1 | — | — | — | 10 | 10 | 2.5 | 2 | — | — | — | 2 |
| Ointment of Mercury ... | 30 | 50 | 48.5 | 33 | 50 | 30 | 30 | 50 | 50 | 50 | 50 | 25 | 20 | 20 | 34 | 50 |
| Solution of Potassium Arsenite ..... | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Wine of Antimony..... | 0.4 | 0.4 | 0.4 | 0.4 | — | 0.4 | 0.4 | 0.4 | 0.46 | 0.5 | 0.5 | 0.4 | — | 0.4 | 0.4 | 0.42 |
| Dover's Powder — Per cent. of Opium..... | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 14.3 | 8.8 | 10 | 16 | 10 | 10 | 10 | 10 | 10 |

In concluding his paper, Mr. Wilbert observes that the comments on the action of this International Conference have been uniformly favorable, but that in our own country there appears to be a lack of appreciation for the importance of this particular move, and unless we are to be again accused of being backward and ultra-conservative, it will be necessary for the American pharmacist to indicate in a decisive and positive way his appreciation of the necessity of adopting the recommendation of the Brussels Conference, in a general way, if not wholly according to the exact letter of the agreement. The appreciation of this move is admirably voiced in an editorial in the Schweiz. Wochenshr. (1902, 520), in which the editor says: "The twentieth of September, this day on which the agreement was signed, will be a memorable one in the annals of pharmacy —it marks the advent of a new era, the attainment of attempts covering nearly fifty years."—Amer. Journ. Pharm., Jan., 1903, 13–20.

As during the past year the subject of "Standardization" has been a prolific topic, one of the most interesting disquisitions in this direction was an address delivered by Mr. John C. Umney, at an evening meeting of the Pharmaceutical Society of Great Britain (Nov. 11, 1902), his subject being

*Standards for Medicines.*—These he outlines as follows: In the case of crude drugs, the standards to be aimed at are: (1) Entire freedom from admixture and sophistication. (2) Uniformity in character where obtainable by reason of the presence of a certain proportion of well-defined active constituents. For the consideration of these points he divided his subject as follows:

I. *Standards of Purity or Limit of Impurity.*—(*a*) *Chemicals:* (1) Dangerous metallic contamination; (2) ordinary chemical impurities. (*b*) *Drugs:* Freedom from admixture or sophistication, as shown by (1) percentage of ash; (2) percentage of yield to solvents.

II. *Standards of Efficacy.*—(*a*) *Drugs:* Uniformity in character, as shown by percentage of active constituent or constituents. (*b*) *Characters of Galenical Preparations*, as shown by analytical examination.

These are discussed in great detail in their application to the more important drugs, chemicals and galenical preparations, which are considered in classes and individually in the form of numerous tables exhibiting the range of values (ash, yield to menstruum, percentage of active constituents, etc.), as well as the standard proposed by the author.—Pharm. Journ., Nov. 15, 1902, 492–498.

This brings before us the subject of "Assaying," which, as applied to individual drugs and preparations, has elicited numorous papers during the year. Among these, a paper on

*Pharmaceutical Assaying*, and the extent to which it may be profitably practiced, read by Mr. F. T. Harrison, before the Divisional Association,

District No. 10, of Canadian Pharmacists, deserves more than passing mention by reason of its eminently practical character. Mr. Harrison says: The druggist has to combine his business with the professional life. Too often, possibly, the realm of the pharmacist is thought of as confined to the business side of life, and probably no one is so much to blame for this as the pharmacist himself. Devoting himself, as he often does, almost entirely to the business side, he often forgets that, as a professional man, he has a duty to perform in advancing the science of pharmacy for the general good of mankind. One, and an important phase of his professional work, is that of pharmaceutical assaying, and the question arises: "To what extent can a practicing pharmacist, in the hurry of his business life, reasonably and profitably devote himself to testing and assaying the drugs he dispenses?" Speaking from the theorist's standpoint, it may be said that he should test and assay every preparation he dispenses, and for which he is responsible. Frankly, however, it may be said that in the ordinary drug store, such a thing is quite impracticable. The time required, the skill demanded, the expensive apparatus and appliances needed for some of the alkaloidal assays and physiological tests are quite beyond the realm of the ordinary drug store. These can only be profitably done in large manufacturing establishments, where experimental chemists are employed and where every appliance is at hand. There is, however, a large field of work that can be done by the pharmacist without encroaching too largely on his time, and with very small outlay for apparatus. To indicate some of this, the author points out a small selection of apparatus, having in view operations which are simply and rapidly performed, namely: burette, pipette, evaporating dish, separating funnel, nitrometer, specific gravity bottle, three or four Erlenmeyer flasks, and a dozen test-tubes. With this little, inexpensive laboratory stock, very much can be done, and what can be done is pointed out very clearly and practically by the author, using the pharmacopœia as his text. Under some circumstances, the pharmacist might add to his stock of apparatus a microscope for the examination of powdered drugs, while a polariscope might be added for testing volatile oils and many other substances. And this is the line of work that wants to be more and more extended in the Pharmaceutical College.—(Canad. Pharm. Jour., July, 1902, 557–559.)

The importance of the

*Microscopic Examination of Powdered Vegetable Drugs* is evident from the number of investigations that have been published, and is emphasized in an article by Dr. Albert Schneider, addressed particularly to students of pharmacy (Pharm. Era, February 19, 1903, 137) in which he observes that in the United States no other pharmaceutical study has taken such a decided swing forward within the last five years as the critical examination of powdered vegetable drugs. The utilitarian results based on such work are inestimable. No modern pharmacist is deserving of the name who is

not well skilled in the use of a good compound microscope in the study of powdered vegetable drugs. This does not mean merely the ability to manipulate a low-power compound microscope and the making and mounting of sections of well-known vegetable drugs of which the tissues are familiar to every student, or which may be readily determined by the aid of any reference book on the histology of plants. It means rather, the ability to apply the more technical methods of microscopy to vegetable histology; the ability to recognize tissue types and characteristic cell-contents with their possible variations; the ability to recognize the purity or sophistication of simple and compound vegetable powders, powdered spices, insect powders, condition powders, poultry powders, etc. The student should be so well drilled in the study of vegetable histology as to enable him to recognize unerringly any cell-form or cell-content at a glance. Though powdered vegetable drugs will not be officially described in the forthcoming issue of the United States Pharmacopœia, the matter has already been called to the attention of the pharmacopœial revision committees on several occasions, notably by Dr. Henry Kraemer, who has recently published a book on Botany and Pharmacognosy, in which the histological characters of the more important vegetable powders are given. By the time the Pharmacopœia for 1910 is ready for the press, powdered vegetable drugs will have been more carefully studied and it will then be possible to incorporate brief, concise descriptions of official simple vegetable powders.

And while on the subject of "Plant Investigations" it is of interest to remember also that much is being done towards the

*Cultivation of Medicinal Plants.* Referring to the body of this report for information concerning the cultivation of individual plants—such as ginseng, camphor, peppermint, etc., the following concerning the efforts in this direction by the U. S. Department of Agriculture, as outlined by Rodney H. True, will doubtless prove interesting. He says that it has long been a matter of earnest inquiry by thoughtful men whether certain drugs which are now obtained exclusively from foreign sources could not be grown profitably in this country, offering, as the United States does, a great variety of climatic and soil conditions; but apart from sporadic experiments by individuals, little has been accomplished in this direction. It is therefore of interest to learn that the drug-plant investigations of the Bureau of Plant Industry have been reorganized, and, in response to the demands of the times—as indicated in resolutions before pharmaceutical conventions and similar bodies—are engaged with the problems of our crude drug supply. The work begun includes the cultivation of a considerable number of the most important plants capable of growth under conditions of climate and soil in widely separated parts of our country; such plants being for the present belladonna, hyoscyamus, stramonium, digitalis, aconite, arnica, the opium poppy and licorice; the localities, the

States of Florida, North Carolina, Massachusetts, Vermont, Wisconsin, Washington (both east and west of the Cascades), and at Washington, D. C. It is, furthermore, the hope of those in charge of the work to extend the studies involved so as to include the domestication and cultivation of various native drug-plants, the supply of which is obtainable with increasing difficulty from year to year, and experiments have already begun on a small scale with hydrastis, senega, and spigelia. The studies involve the proper period of collection, the manner of curing the drug, collected at the proper period, so as to preserve both appearance and active principle, the part played by oxidizing ferments in bringing about deteriorations, field experiments to determine the value of special treatment in enhancing the quality of the drug, etc.—Amer. Journ. Pharm., Sept., 1902, 419–422.

Leaving out of consideration here the astounding progress made in synthetic chemistry during the past decade or two, and yet in some degree connected with it, the researches on volatile oils from year to year furnish an ever-increasing number of papers. And so in this report there will be found a large number of highly interesting abstracts, while, for want of space, much that might be interesting had of necessity to be simply referred to in a general way. So, for instance, the admirable contribution of Prof. Edward Kremers, on the volatile oils proposed for admission into the Pharmacopœia of 1900. Among the most interesting contributions in this direction, also, is the very scholarly study of the "Sesquiterpenes," by Mr. Oswald Schreiner, which will be found outlined under the chapter on Volatile Oils.

Considering the activity manifested in all the sciences that are concerned in modern pharmacy and medicine, one should think there would be little time left for the investigation of the ancient and obsolete. Yet the time has been found by eminent investigators to give us some reliable information concerning the

*"Kyphi Formulæ" of the Ancient Egyptians.*—Dr. Albert Schneider has translated the German text of an investigation concerning two authentic "kyphi formulæ," the one contained in the Ebers papyrus (at Leipzig), the other obtained from the mural inscriptions of the large temple at Erdfu, undertaken and carried out by Dr. R. Stube, of Berlin. This investigation also includes a translation of the so-called "formula of Siascarides," which is unquestionably also an authentic kyphi formula, of Egyptian origin, but is not found in the Egyptian medical literature—the name being undoubtedly identified with Dioscorides, in whose writings the complete formula is to be found. Furthermore, Dr. Stube embodied in his translations a few cosmetic remedies which he found in the Ebers papyrus. In his introductory to the English translation of the manuscript prepared by Dr. Stube, Dr. Schneider remarks that, being perhaps the only direct information regarding the kyphi formulæ of the ancient Egypt-

ians and the Greeks, while possibly of little direct and practicable scientific value, it is very valuable historically, as giving an insight into Egyptian medical science and culture. Referring to the opinion expressed by Dr. Stube that the implied value to certain references, suggested by Mr. Rauch, to Ebers novel "*Uarda*," cannot serve as a scientific statement of the subject, Dr. Schneider observes that although the novel "*Uarda*" is purely a work of fiction, it has, nevertheless, scientific value because the author has conscientiously applied the knowledge obtained from the careful study of old Egyptian excavations, including the history-making papyri and other evidences giving an insight into ancient Egyptian culture and civilization. While some of these papyri contain numerous references to the superstitious practices of the time, others, notably the Ebers papyri, are quite free from such references. Speaking of the kyphi itself, Dr. Schneider mentions that L. Voight, the eminent chemist of Berlin, had three varieties of kyphi prepared; that after the formula of Dioscorides was the best, consisting of rosin, wine, galanga root, juniper berries, roots of aromatic rush, asphalt, mastic, myrrh, Burgundy grapes, and honey. The ancient Egyptians made this kyphi into balls which were placed upon the burning logs of the sacrificial altar, filling the wide space of the temple halls with a heavy perfume. Another frequently employed incense consisted of the berries of *anta* (from *Balsamodendron myrrhæ*). Pills for perfuming the breath were also much used, those for women having honey added, as will be explained in the translation. The Ebers papyrus also contains recipes for exterminating noxious insects. Remedies to promote the growth of hair were very common; in these, blood from a black ox was a favorite ingredient. Creative power was attributed to blood, and it was believed that the blood from a black animal would also restore the natural color of hair. The full text of the English translation of Dr. Stube's manuscript may be consulted in Merck's Rep., Sept. and Oct., 1902, 342–343 and 380–382.

Coming again to modern subjects we have an interesting critical com parison of

*The B. P. 1898 vs. the U. S. P. 1890,* in a paper read by Professor Herman J. Lohmann at the thirty-second annual meeting of the New Jersey Pharmaceutical Association in 1902, in which the author points out certain defects, as well as the relative merits of these two standards of the English-speaking peoples. His criticisms, covering the entire range—chemical compounds, botanical drugs, products, and galenical preparations—may be profitably consulted in the "Proceedings" of the Association referred to (1902, 49–57). Another commendable communication in the same "Proceedings" is that of Professor P. E. Hommell, who has made some inquiries into the extent to which the preparations of

*The National Formulary* are prescribed. The author mentions quite a formidable list of such as appear to have found more or less favor with physi-

cians. Nevertheless, these preparations are certainly not prescribed as much as they should be, for they meet the demand made by the medical fraternity for many agreeable as well as effective remedies in a non-proprietary form. The author considers it a duty of the pharmacist to talk "National Formulary Preparations" to his physicians as often as possible, and to exhibit to them preparations put up in good shape. Further, he considers that it would be a good plan for the different pharmaceutical associations to condense the National Formulary into a pocket edition for physicians' use, and that the druggist give one to each of his doctors. It appears thus to have escaped Prof. Hommell's notice that in

*The Epitome of the National Formulary*, such a work is already provided by this Association for the very purposes named. In fact, it is astonishing how little in touch with the affairs of the American Pharmaceutical Association some of the state associations seem to be. Thus, for years it has been the endeavor to prepare for this report a brief synopsis of the

## Proceedings of the State Pharmaceutical Associations.

To do so with accuracy, such a synopsis should be prepared from the printed or otherwise authentic reports of these meetings; yet, at no time have over one-half of the published proceedings of the different State Pharmaceutical Associations been available for this purpose. And so this year again, out of the total number of associations mentioned in the following, the information concerning their annual meetings during 1902 was obtained only in eighteen cases from the printed "Proceedings" of the respective associations—the source of information being noted in each case—while the more or less imperfect abstracts of the others have been gathered from the brief notes appearing in the pharmaceutical press.

*Alabama.*—The Twenty-first Annual Meeting of the Alabama Pharmaceutical Association was held at Birmingham, May 7 and 8, 1902, in three sessions. L. S. Brigham, of Montgomery, was elected President; W. E. Bingham, of Tuscaloosa, Secretary. The following papers were read:

"Lacinaria," by Lawrence Campbell Lewis.

"Calomel Quibbles," by Jas. W. Milner. (*From Proceedings.*)

*Arkansas.*—The Twentieth Annual Meeting of the Arkansas Pharmaceutical Association was held at Little Rock, May 13 to 15, 1902, in three sessions. Wm. R. Appleton, of El Dorado, was elected President; Latta K. Snodgrass, of Little Rock, Secretary. The following papers were read:

"The Duties and Responsibilities of the Dispenser," by Leon J. Kosminsky.

"Why Stand Ye Here All the Day Boosting Some Other Fellow," by W. F. Blocker.

"The Drug Clerk," by W. B. King.

"Pharmaceutical Biology," by Dr. Edward T. Mitchell.

"Pharmacy," by L. H. Dancy. (*From Proceedings.*)

*Colorado.*—The Thirteenth Annual Meeting of the Colorado Pharmaceutical Association was held at Denver, July 10 and 11, 1902. A. W. Scott, of ———, was elected President; C. E. Ward, of ———, Secretary. The following papers were read:

"How Can the Drug Business be Made More Pleasant and Remunerative?" by ——— ———.

"Is Our Present Pharmacy Law Satisfactory?" by ——— ——— (*From Journals.*)

*Connecticut.*—The Twenty-sixth Annual Meeting of the Connecticut Pharmaceutical Association was held at New London, June 17 and 18, 1902. A. L. Dickinson, of Danbury, was elected President; Charles A. Rapelye, of Hartford, Secretary. The following papers were read:

"The Pharmacy of the Future," by J. A. Liverty.

"Random Notes," by J. K. Williams. (*From Journals.*)

*Delaware.*—The Sixteenth Annual Meeting of the Delaware Pharmaceutical Association was held at Smyrna, June 5, 1902. Eldad L. Clarke, of Dover, was elected President; F. W. Fenn, of Wilmington, Secretary. (*From Journals.*)

*Georgia.*—The Twenty-seventh Annual Meeting of the Georgia Pharmaceutical Association was held in Brunswick, May 20 and 21, 1902, in four sessions. John H. Polhill, of Brunswick, was elected President; J. B. Riley, of Macon, Secretary. The only paper read was the following:

"Our Pharmacy Laws," by Max Morris. (*From Proceedings.*)

*Illinois.*—The Twenty-third Annual Meeting of the Illinois Pharmaceutical Association was held at Jacksonville, May 20 to 22, 1902. H. Swannell, of Champaign, was elected President; R. N. Dodds, of Springfield, Secretary. (*From Journals.*)

*Indiana.*—The Twenty-third Annual Meeting of the Indiana Pharmaceutical Association was held at Anderson, June 17 to 19, 1902. Otto C. Bastian, of South Bend, was elected President; A. Timberlake, of Indianapolis, Secretary. The following papers were read:

"Side Lines," by A. J. Detzer.

"The Drug Business in Small Towns," by G. A. Baas.

"Notes on Advertising," by A. R. Otis.

"The Other Fellow's Drug Store," by V. E. Silverburg.

"Pharmacy of the Future," by J. N. Roe.

"Some Prescriptions," by J. W. Sturmer.

"Concerning the Starches," by J. S. Wright. (*From Journals.*)

*Indian Territory.*—The Eighth Annual Meeting of the Indian Territory Pharmaceutical Association was held at Checotah, May 20, 1902. N. F. Hancock, of Muscogee, was elected President; H. T. Knisely, of Checotah, Secretary and Treasurer. The following papers were read:

"Manufacturing Our Pharmaceutical Preparations," by M. Tidwell.

"Requirements to Make a Good Drug Establishment," by F. C. Savage. (*From Journals.*)

*Iowa.*—The Twenty-third Annual Meeting of the Iowa Pharmaceutical Association was held at Sioux City, July 8–10, 1902, in three sessions. Howard S. Baker, of Sioux City, was elected President; Fletcher Howard, of Des Moines, Secretary. The following papers were read:

"The Value of a Pharmaceutical Convention from a Woman's Standpoint," by Mrs. Fletcher Howard.

"How Best to Improve the Relationship Between the Druggist and Practicing Physician," by J. M. Lindly.

"My Most Humorous Experiences in a Drug Store," by W. L. Leland. (*From Proceedings.*)

*Kansas.*—The Twenty-third Annual Meeting of the Kansas Pharmaceutical Association was held at Wichita, May 27, 1902. J. W. Cookson, of Kingman, was elected President; Dora C. Fischer, of Leavenworth, Treasurer. The following papers were read:

"Trade Interests," by W. S. Amos.

"Progress in Pharmacy," by Dora C. Fischer.

"The Immaterial Versus the Material in Medicine," by L. E. Sayre. (*From Journals.*)

*Kentucky.*—The Twenty-fifth Annual Meeting of the Kentucky Pharmaceutical Association was held at Grayson Springs, June 24 to 27, 1902, in four sessions. H. K. McAdams, of Lexington, was elected President; J. W. Gayle, of Frankfort, Secretary. The following papers were read:

"The Drug Store of the Future—What Will It Be?" by Simon N. Jones.

"How To Save Money by Avoiding Waste and Loss in Various Directions," by Vernon Driskell.

"The Value of Organization to Each Individual Druggist," by Simon N. Jones.

"Why the Full Price Plan of the Sterling Remedy Company Should Be Appreciated and Endorsed by the Retail Druggist," by Simon N. Jones.

"What Special Thing Do I Know About My Business?" by Vernon Driskell.

"Co-operation and Interchange of Ideas," by H. Fabra and D. R. Henderson.

"The Fallacy of Substitution," by C. J. Rosenham.

"Plans and Suggestions that will Make the Kentucky Pharmaceutical Association More Valuable to its Members or that Will Secure New Members," by Vernon Diskell.

"Aromatic Spirit of Ammonia," by Gordon L. Curry.

"Practical Suggestions," by B. M. Overton. (*From Proceedings.*)

*Maine.*—The Twenty-fifth Annual Meeting of the Maine Pharmaceu-

tical Association was held at Portland, July 8 and 9, 1902, in two sessions. D. P. Moulton, of Lewiston, was elected President; M. L. Porter, of Danforth, Secretary. (*From Proceedings.*)

*Maryland.*—The Twentieth Annual Meeting of the Maryland Pharmaceutical Association was held at Blue Mountain House, June 24 to 26, 1902. J. Webb Foster, of Baltimore, was elected President; Owen C. Smith, of Baltimore, Secretary. The following papers were read:

"On the Adulteration of Cream of Tartar," by D. Base.

"Elixir of Iron, Quinine and Strychnine," by W. R. Rudy.

"Sale of Narcotics," by W. J. Elderdice.

"Examination of Gum Arabic," by L. Schulze.

"Book-keeping," by L. Schulze.

"A Systematic Course of Study for Pharmacists," by L. Schulze.

"Legitimate Pharmacy," by R. S. McKinney. (*From Journals.*)

*Massachusetts.*—The Twenty-first Annual Meeting of the Massachusetts State Pharmaceutical Association was held at Northampton, June 3 to 5, 1902, in five sessions. Wm. J. Bullock, of New Bedford, was elected President; James F. Guerin, of Worcester, Permanent Secretary. The following papers were read:

"Variation of Drugs and Chemicals from Standards of Strength and Purity," by Frederick T. Drake.

"Notes from the Analytical Laboratory of the Massachusetts College of Pharmacy," by Dr. J. W. Baird.

"Antitoxin Serums and Vaccine Virus," by C. F. Nixon.

"Reminiscences of Experiences on Board of Pharmacy," by Amos K. Tilden.

"The Chemistry of Minerals," by H. R. Mason.

"Laboratory Contributions," by Wilbur L. Scoville. (*From Proceedings.*)

*Michigan.*—The Twentieth Annual Meeting of the Michigan State Pharmaceutical Association was held at Saginaw, August 12 and 13, 1902, in three sessions. L. G. Moore, of Saginaw, was elected President; W. H. Burke, of Detroit, Secretary. The following papers were read:

"The N. A. R. D. and Our Relation to It," by J. Major Semen.

"Evidences of the New Order in Pharmacy," by Harry B. Mason.

"Adulterations," by A. B. Stevens and J. O. Schlotterbeck, as "Committee on Adulterations." (*From Proceedings.*)

*Minnesota.*—The Eighteenth Annual Meeting of the Minnesota State Pharmaceutical Association was held at Lake Minnetonka, June 17 to 19, 1902, in four sessions. Andrew J. Eckstein, of New Ulm, was elected President; Theo. F. Leeb, of Winona, Secretary. The following papers were read:

"An International Pharmacopœia," by F. J. Wulling.

"Acetic Acid as a Menstruum," by F. J. Wulling.

"The College of Pharmacy of the University of Minnesota—Historical." A continuation, by the Dean, Prof. F. J. Wulling. (*From Proceedings.*)

*Mississippi.*—The initial steps towards the formation of a State Pharmaceutical Association in Mississippi were taken at a gathering of prominent druggists at Jackson, on July 10, 1902. C. W. Whitney, Jr., of Fayette, was elected President; Stacey Lord, of Greenville, Secretary. (*From Journals.*)

*Missouri.*—The Twenty-fourth Annual Meeting of the Missouri Pharmaceutical Association was held at Turtle Springs, Warmsburg, June 10 to 13, 1902, in six sessions. R. L. Hope, of Centralia, was elected President; H. M. Whelpley, of St. Louis, Permanent Secretary. The following papers were read:

"National Pure Food and Drug Legislation," by Wm. Mittelbach.

"Indian Pharmacy," by J. F. Llewellyn.

"Methyl Salicylate in Our Pharmacopœia," by Gustavus Hinrichs.

"The Question of Modern Substitution must be Fairly Treated," by Francis Hemm.

"Preparations of Calendula," by T. A. Moseley.

"Immunity," by J. F. Llewellyn.

"Mounting Microscopic Objects," by H. M. Whelpley. (*From Proceedings.*)

*Montana.*—The —— Annual Meeting of the Montana Pharmaceutical Association was held at Butte, August 21, 1902. J. M. Doull, of Butte, was elected President; C. B. Hoskins, of Butte, Secretary. (*From Journal.*)

*Nebraska.*—The Twenty-first Annual Meeting of the Nebraska Pharmaceutical Association was held at Columbus, June 3 to 5, 1902. C. E. Hopping, of Beaver City, was elected President; W. M. Tonner, of Lynch, Secretary. (*From Journal.*)

*New Hampshire.*—The Twenty-ninth Annual Meeting of the New Hampshire Pharmaceutical Association was held at "The Weirs," July 1 and 2, 1902. Herbert E. Rice, of Nashua, was elected President; John H. Marshall, of Manchester, Secretary. (*From Journal.*)

*New Jersey.*—The Thirty-second Annual Meeting of the New Jersey Pharmaceutical Association was held at Atlantic City, June 4 and 5, 1902, in three sessions. Herman J. Lohmann, of Jersey City, was elected President; Frank C. Stutzlen, of Elizabeth, Secretary. The following papers were read:

"Some Odds and Ends of the Drug Store," by Clement B. Lowe.

"The B. P., 1898, vs. U. S. P., 1890," by Herman J. Lohmann.

"Methyl Alcohol: Extent of its Employment from a Pharmaceutical Standpoint," by P. E. Hommell.

"The Synthetic Remedies. Is their Exhibition Increasing or Decreasing?" by P. E. Hommell.

"Are the National Formulary Preparations Prescribed as Much as they Should Be?" by P. E. Hommell.

"Should Sarsaparilla be Retained in the U. S. Pharmacopœia?" by P. E. Hommell.

"Comments on Some of the Queries for 1902" (Improvement of Spirit of Nitrous Ether; Benefit of Pharmaceutical Association to the Retail Drug Business; U. S. Pharmacopœia Preparations Requiring Improvement; Poison Laws; Is the Complaint of Substitution Behind the Prescription Counter Satisfied; The Latin Language; Salol in Mixtures), by H. B. Otto.

"Contracts—Warning to Members," by Charles Holzhauer. (*From Proceedings.*)

*New York.*—The Twenty-fourth Annual Meeting of the New York State Pharmaceutical Association was held at Elmira, June 24 to 27, 1902. Thomas Stoddart, of Buffalo, was elected President; E. S. Dawson, of Syracuse, Secretary. The following papers were read:

"The American Pharmaceutical Association," by E. A. Sayre.

"Reading of Papers Before Associations," by F. B. Tuthill.

"The Kind of Analytical Chemistry Every Pharmacist Should Make Use of," by E. S. Dawson.

"Shop Notes and Dispensing Hints," by E. S. Dawson. (*From Journals.*)

*North Carolina.*—The Twenty-third Annual Meeting of the North Carolina Pharmaceutical Association was held at Morehead City, June 19 and 20, 1902, in four sessions. W. T. Hicks, of Raleigh, was elected President; P. W. Vaughan, of Durham, Secretary. The following papers were read:

"Trade-Marks," by E. V. Howell.

"Tablets," by P. C. Gray.

"Syrup of Ferrous Iodide," by E. V. Howell. (*From Proceedings.*)

*North Dakota.*—The Seventeenth Annual Meeting of the North Dakota State Pharmaceutical Association was held at Grand Forks, Aug. 5 to 7, 1902, in three sessions. S. McDonald, of Grand Forks, was elected President; W. S. Parker, of Lisbon, Secretary and Treasurer. (*From Proceedings.*)

*Ohio.*—The Twenty-fourth Annual Meeting of the Ohio State Pharmaceutical Association was held on the steamer "City of Cleveland" during its passage from Cleveland to Mackinac Island and return, July 8 to 12, 1902, in six sessions. O. N. Garrett, of Hillsboro, was elected President; Lewis C. Hopp, of Cleveland, Permanent Secretary. The following paper was read:

"What Did Ohio Do at the Buffalo Convention? What Did Her Delegates Accomplish?" by Jno. Byrne. (*From Proceedings.*)

*Oklahoma*—The Twelfth Annual Meeting of the Oklahoma Pharma-

ceutical Association was held at Enid, May 14, 1902. J. C. Burton, of Stroud, was elected President; F. M. Weaver, of Oklahoma City, Secretary. (*From Journals.*)

*Pennsylvania.*—The Twenty-fifth Annual Meeting of the Pennsylvania Pharmaceutical Association was held in the Buena Vista Springs Hotel, Franklin county, June 24 to 26, 1902, in 5 sessions. Charles L. Hay, of Du Bois, was elected President; Jacob A. Miller, of Harrisburg, Secretary. The following papers were read:

"Adulterated Asafœtida," by C. H. LeWall.
"Consolidation of Drug Stores," by W. H. Reed.
"Cutting of Prices, Can it be Prevented?" by J. H. Redsecker.
"Gasometric Analysis," by F. X. Moerk.
"Hydrogen Peroxide," by R. C. Pursel.
"Laboratory Notes," by H. F. Ruhl.
"Laboratory Notes," by R. C. Pursel and Willard Graham.
"Laws Relating to the Sale of Poisons," by J. L. Lemberger.
"Leeches, How to Care for Them," by J. L. Lemberger.
"Methods of Advertising," by L. S. Vowell.
"Oleates, etc., in Powder Form," by F. E. Niece.
"Physostigmine Salts in Solution," by Dr. J. S. Beamensderfer.
"Profession and Trade," by J. F. Patton.
"Powders—Methods of Dividing," by I. M. Weills.
"Synthetic Chemicals in the New Pharmacopœia," by M. I. Wilbert.
"Tincture of Arnica," by H. F. Ruhl.
"Tincture of Iodine," by T. H. Utech.
"Treatment of Wounds by the Apothecary," by Clement B. Lowe. (*From Proceedings.*)

*Rhode Island.*—The Twenty-seventh Annual Meeting of the Rhode Island Pharmaceutical Association was held at Warwick on July 9, 1902. (*From Journals.*)

*South Carolina.*—The Twenty-sixth Annual Meeting of the South Carolina Pharmaceutical Association was held at Charleston, May 21 and 22, 1902, in two sessions. J. A. Barbot, of Charleston, was elected President; Frank M. Smith, of Charleston, Secretary. (*From Proceedings.*)

*South Dakota.*—The Seventeenth Annual Meeting of the South Dakota Pharmaceutical Association was held at Flandreau, August 5 to 7, 1902. Charles W. Peaslee, of Redfield, was elected President; E. C. Bent, of Dell Rapids, Secretary. (*From Journals.*)

*Tennessee.*—The Seventeenth Annual Meeting of the Tennessee State Druggists' Association was held at Bon Aqua, July 16 and 17, 1902, in four sessions. R. L. Eves, of Nashville, was elected President; E. F. Trolinger, of Bell Buckle, Secretary. The following papers were read:

"What Are the Best Methods of Creating a Greater Interest in the

State Association, and Increasing the Attendance at the Annual Meetings?" 2 papers: by R. W. Vickers and S. F. Knott.

"How to Prevent the Accumulation of Dead Stock," by W. D. Muse.

"The Best Means to Cultivate Better Social Relations Among Pharmacists," by E. W. Holcombe.

"Best Methods of Advertising that Can be Adopted by the Retail Pharmacist." 3 papers: by J. L. Nelson, E. W. Holcombe, and William R. White.

"Prize Formulæ." 3 papers: by A. B. Rains, B. B. Kerr, and J. Goldbaum. (*From Proceedings.*)

*Texas.*—The Twenty-third Annual Meeting of the Texas Pharmaceutical Association was held at Dallas, April 22 to 24, 1902. E. G. Eberle, of Dallas, was elected President; C. A. Taylor, of Midland, Secretary and Treasurer. The following papers were read:

"Adulteration," by J. Schrodt.

"How to Make the Drug Business Pleasant and Remunerative," by J. J. Thames. (*From Journals.*)

*Virginia.*—The Twenty-first Annual Meeting of the Virginia Pharmaceutical Association was held at the Buckroe Beach Hotel, July 15 to 17, 1902. R. C. Petzold, of Newport News, was elected President; C. B. Fleet, of Lynchburg, Secretary. (*From Journals.*)

*Washington.*—The Thirteenth Annual Meeting of the Washington Pharmaceutical Association was held at Spokane, July 10, 1902. E. Blounk, of Seattle, was elected President; W. P. Bonney, of Tacoma, Secretary. (*From Journals.*)

*Wisconsin.*—The Twenty-second Annual Meeting of the Wisconsin Pharmaceutical Association was held at Milwaukee, August 19 to 21, 1902, in five sessions. W. H. Barr, of Milwaukee, was elected President; Henry Rollmann, of Chilton, Secretary. The following papers were read:

"The Charge of Druggists Being Substitutors;" 3 papers, by Leo Mayo, Alf. H. Kelling, and Charles J. Sacksteder.

"History of A Wisconsin Drug Store," by E. B. Heimstreet.

"Can a Druggist Become Successful Without Attending College;" 2 papers, by B. B. Byers and "An old Country Druggist."

"Home-Made Syrup Tank," by Ben. W. Smith.

"A Quick, Convenient and Practicable Chocolate Strainer," by Ben. W. Smith.

"Relative Advantages of Doing Business in the City and Country," by J. M. Farnsworth.

"Experience of A Candidate for Examination Before the Wisconsin Board of Pharmacy," by B. B. Byers.

"Prophecy of the Drug Store in 1925," by E. G. Raeuber.

"What is the Best Method of Storage of Goods?" by Max R. Zaegel.

"Biography of an Old Wisconsin Druggist—Adam Conrath," by E. G. Raeuber.

"Biography of an old Wisconsin Druggist—John Graham," by H. E. B. (*From Proceedings.*)

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# PHARMACY.

## A. Apparatus and Manipulations.

*Specific Gravities—Theory and Practice in Its Application to the U. S. P.*—Dr. A. B. Lyon, discussing the theories that have been advanced concerning a proper standard in pharmacopœial specific gravity determination, concludes that there is no better way, for practical purposes, than to leave the conditions as they are at present. He hopes to see in the new U. S. Pharmacopœia: 1. Retention of the standard $\frac{15^{\circ}}{15^{\circ}}$ in the statement of specific gravities of liquids. 2. All specific gravities apparent, not reduced to vacuum. 3. With each specific gravity the temperature correction for 1°, by which the apparent specific gravity obtained by observation may be made to correspond with that taken at standard temperature. 4. In exceptional cases, apparent specific gravities, taken with ordinary instruments, at special temperatures, with corresponding temperature correction. Objection may be made by some that this is not "scientific." The sufficient answer is that it is not unscientific, and that the Pharmacopœia is not a text-book of science, but eminently a book for the practical man, who knows that minutes have a money value.—Pharm. Rev., July, 1902, 317.

*Metric Weights and Measures—Increasing Popularity in English-Speaking Countries.*—M. I. Wilbert speaks hopefully of the headway made in the popular use and acceptance of metric weights and measures among English-speaking people. This is largely due to the fact that the manufacturers of English countries have been getting practical lessons in the necessity of adapting their products to the needs and wants of the foreign consumers, if they wish to compete successfully for their trade, and British as well as American manufacturers are beginning to heed the lesson. Thus, in England, steps are being taken to popularize, and ultimately to introduce, not alone the metric system of weights and measures, but also a decimal system of coinage. In this country, as is well known, the agitation in the same direction has met with a certain measure of success. The metric system is officially recognized in various departments of the government, and has been adopted as the most convenient in many of the large mechanical establishments, such as locomotive work, bridge-building, etc. But, despite its official recognition by the medical department of the

U. S. Army and Navy, and of the Marine Hospital service, the metric system has made comparatively little progress with the rank and file of the medical and pharmaceutical profession, and its general introduction will most likely be brought about by the changes that have been made in our commercial and industrial solutions with the countries where it has been adopted.—Amer. Jour. Pharm., Sept. 1902, 411–418.

*Pound-Kilo Reference Table—Convenience for Export Trade.*—A New York firm of exporters have issued a comparative table giving the equivalents in kilograms (metric system) of pounds avoirdupois. The sheet is designed for the use of American manufacturers in the preparation of orders for export shipment, and in view of the efforts being made by drug firms to capture trade in Spanish-American countries, where the metric system is used. The principal part of this table is reproduced in the "Amer. Drugg.," July 14, 1902, as follows:

POUNDS AND KILOS.—COMPARATIVE TABLE.

| Lbs. | Kilos. | Lbs. | Kilos. | Lbs. | Kilos. | Lbs. | Kilos. | Lbs. | Kilos. |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.452 | 21 | 9.50 | 41 | 18.55 | 61 | 27.59 | 81 | 36.64 |
| 2 | 0.905 | 22 | 9.95 | 42 | 19.00 | 62 | 28.04 | 82 | 37.09 |
| 3 | 1.357 | 23 | 10.40 | 43 | 19.46 | 63 | 28.50 | 83 | 37.54 |
| 4 | 1.809 | 24 | 10.86 | 44 | 19.91 | 64 | 28.95 | 84 | 38.00 |
| 5 | 2.262 | 25 | 11.31 | 45 | 20.36 | 65 | 29.41 | 85 | 38.45 |
| 6 | 2.715 | 26 | 11.76 | 46 | 20.81 | 66 | 29.86 | 86 | 38.90 |
| 7 | 3.167 | 27 | 12.22 | 47 | 21.26 | 67 | 30.31 | 87 | 39.35 |
| 8 | 3.618 | 28 | 12.67 | 48 | 21.72 | 68 | 30.76 | 88 | 39.80 |
| 9 | 4.072 | 29 | 13.12 | 49 | 22.17 | 69 | 31.22 | 89 | 40.26 |
| 10 | 4.525 | 30 | 13.57 | 50 | 22.62 | 70 | 31.67 | 90 | 40.71 |
| 11 | 4.977 | 31 | 14.03 | 51 | 23.07 | 71 | 32.12 | 91 | 41.16 |
| 12 | 5.430 | 32 | 14.48 | 52 | 23.52 | 72 | 32.67 | 92 | 41.61 |
| 13 | 5.882 | 33 | 14.93 | 53 | 23.98 | 73 | 33.02 | 93 | 42.06 |
| 14 | 6.334 | 34 | 15.38 | 54 | 24.43 | 74 | 33.48 | 94 | 42.52 |
| 15 | 6.787 | 35 | 15.84 | 55 | 24.88 | 75 | 33.93 | 95 | 42.97 |
| 16 | 7.239 | 36 | 16.29 | 56 | 25.33 | 76 | 34.38 | 96 | 43.42 |
| 17 | 7.694 | 37 | 16.74 | 57 | 25.78 | 77 | 34.83 | 97 | 43.87 |
| 18 | 8.143 | 38 | 17.19 | 58 | 26.24 | 78 | 35.28 | 98 | 44.32 |
| 19 | 8.595 | 39 | 17.65 | 59 | 26.69 | 79 | 35.74 | 99 | 44.78 |
| 20 | 9.050 | 40 | 18.10 | 60 | 27.15 | 80 | 36.20 | 100 | 45.25 |

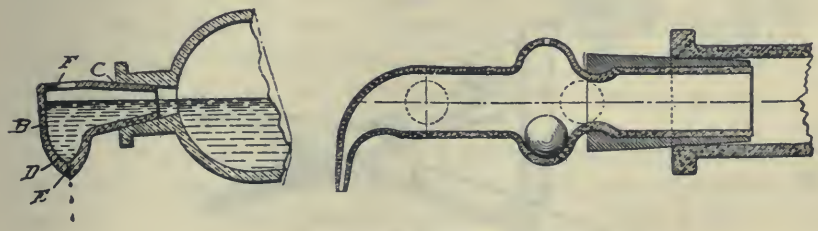
1 kilogram equals 2 1–5 pounds.

*Drops as Dose Measures—Advantages and Disadvantages.*—Interestingly reviewing the literature on "Drops as Dose Measures," M. I. Wilbert, after discussing the difficulties in the way of establishing a standard, arrives at some practical conclusions which merit attention. He says: "Admitting that drops, as ordinarily produced, are necessarily variable, and that it is practically impossible to obtain uniform results, the question naturally arises, Why should we not dispense with drops entirely and endeavor to introduce some more definite measure of capacity? While

this is no doubt possible in some cases, still it must be remembered that drops are of advantage in the administration of many forms of remedies. For instance, in cases where the relative amount of a drug or preparation is of importance, or where the dose of some potent remedy is to be alternately increased and decreased," such as arsenic solutions and their salts, solution of potassium iodide, tincture of digitalis, or tincture of nux vomica. "With several of these preparations the initial dose is of comparatively little importance, the object that is usually sought being to find out the amount that will be tolerated by the patient. For this purpose the dose is gradually increased until marked evidences of physiological action manifest themselves; then the dose is either decreased slightly and continued, or in some cases decreased again gradually to the starting point. The advantages possessed by drops as dose measures in practices of this kind are quite apparent." "The practical use or application of drops would also appear to offer another reason for adopting, as the popular idea of a drop, the maximum quantity that may be obtained by any of the usual methods of dropping." In conclusion the author calls particular attention to two points. The first is that the dropping of approximate quantities, where weights or measures are directed, is a habit that is reprehensible, and should not be countenanced or practiced under any conditions. The second point is that it would appear impracticable at the present time to adopt a fixed standard for a drop or dropper unless we are able to compel every one to use an accurately made and somewhat complicated dropping device. Otherwise the factors that enter into and govern the size of the drop are too numerous to be brought under control in the present state of our knowledge.—Amer. Journ. Pharm., Aug., 1902, 375–384.

*Medicine Dropper—Novel Form Adapted to Bottles.*—Geo. B. Hutchings has devised the medicine dropper shown by Fig. 1 at *B*. It has a tapering end, *C*, terminating in an open end, this tapering end being

FIG. 1. FIG. 2.




Medicine Droppers.

fitted to the neck of the bottle and being made sufficiently tapering so as to adapt it for use in connection with various sizes of bottles. At right angles to the tapering base there is formed a projection, *D*, terminating in a pointed end provided with a perforation, *E*. As the bottle is tilted

to the position shown, the liquid fills the interior of the dropper and the drops issue through the perforation or orifice, *E*, with regularity and of uniform size and weight. A vent or opening, *F*, in line with the discharging orifice, equalizes the air-pressure, and provides access to the interior of the dropper for the purpose of cleansing.—Merck's Rep., April, 1903, 106.

*Another new dropper* is the one shown by Fig. 2, devised by W. L. Strauss. It consists of a hollow tube, one end of which is provided with a tapering elastic cover to fit the neck of the bottle, while the other end is drawn out and bent downward to form the dropping end. The tube is expanded in the middle and contains a ball. When held upright this ball acts as a seal to the bottle; when held horizontally the ball falls into the depression formed by the expanded portion of the tube, and allows the liquid to flow forward. The fore end of the tube is slightly narrowed in order to prevent the ball from rolling forward and obstructing the canal. A small orifice in the expanded part of the tube allows air to enter the bottle when in the act of dropping liquids.—Merck's Rep,, May, 1903, 135.

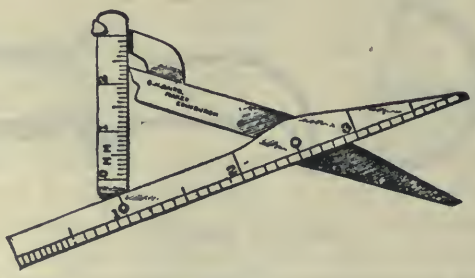
*Combination Funnel-Measure—A Convenient Utensil.*—W. Haldenwanger has described the practical combination of a funnel and measure, shown by Fig. 3. The new measure is made of porcelain and, as will be seen, entirely obviates the necessity of using a separate funnel. It is stated to be particularly well adapted for viscid liquids, such as castor oil, etc. For liquids which require straining, a pledget of cotton or other suitable filtering material may be placed in the neck of the funnel.—Merck's Rep., June, 1903, 165; from Chem. Ztg. Rep., i, xxvi 104.

FIG. 3.

Funnel Measure.

*Micrometer—New Form.*—Sir J. D. Hooker has devised the little instrument for measuring parts of flowers, seeds, etc., shown by Fig. 4. By the simple adjustment of a scale to one arm of the micrometer the length

FIG. 4.

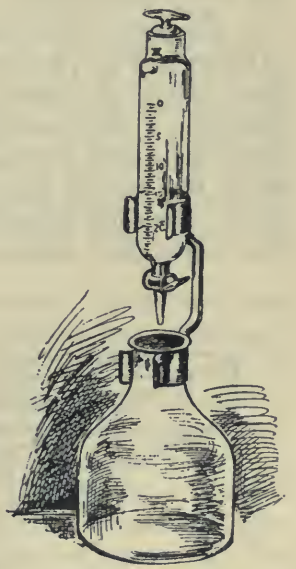


Micrometer.

of an object is recorded up to the fraction of an inch or millimeter, and can be read off at leisure. One side of the scale is graduated to inches and fractions and the other to millimeters, so that it can be used for either scale, and the one scale can be converted into the other without calculations. The instrument is four inches long, and can be carried in the waistcoat pocket.—Pharm. Journ., Dec. 27, 1902, 704.

*Weight-Burette—A Useful Apparatus for Alkaloidal Determinations.*—E. Theo. Brewis has devised the "weight burette" and fittings, shown by Fig. 5. The flask is one of the alkaloid-flasks made of Jena glass which Mr. Brewis uses for evaporating alkaloidal solutions. These flasks are now made each of about the same weight and dimensions, so that they are not only interchangeable when forming part of any apparatus, but as equal volumes of liquids in them occupy similar spaces, changes of color or appearance (in experiments involving the comparison of liquids) can be readily observed. As soon as the residue is dry and its weight determined, the brass double clip is slipped upon the neck, and the burette with its weighed contents is put in the other clip. The titration is then done, and the amount of standard acid used is read off and checked by again weighing the burette with its unused acid. There is a pin-hole in the stopper as well as in the neck of the burette to permit free running of the contents when the holes are superposed. Both upper and lower stoppers are numbered as the burette is, and the lines and figures are enamelled in uniform color, but differing with the nature of the standard solutions for which the burettes are used. The following are the dimensions of the flask: Total height, 100 Mm.; diameter of bottom, 70 Mm.; diameter of neck, 12 Mm.; average weight, 43 Gm.; and working capacity, 125 Cc. The burette has a capacity of 25 Cc. The arrangement altogether is excellent and those who have to work out laboratory estimations, which represent tons of material will appreciate the precision that the apparatus gives.—Chem. & Drug., Mar. 21, 1903, 472.

FIG. 5.

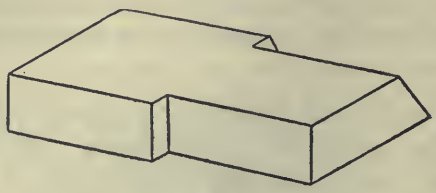


Weight-Burette.

*Powder Folder—Simple Construction.*—Joseph F. Hostelley describes the simple powder folder shown by Fig. 6, which may be cheaply constructed from a block of hard wood—walnut, oak or cherry—and will answer all the requirements of a more costly device. It will be readily

seen that over the upper broad surface two sizes of powders may be folded. Turning the block completely over, two more gauges larger in

FIG. 6.

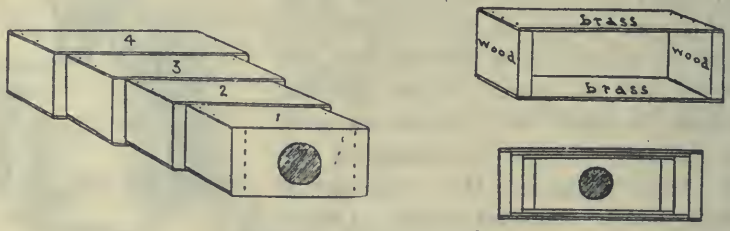


Powder Folder.

size are presented. The block may be so shaped that the length of it on one side will form a guide for folding long powders, while on the reverse, extra long ones may be folded. To make this contrivance more durable, the broad surfaces may be covered with sheet brass screwed to the wood, the screws counter-sunk.—Drug. Circ., Feb., 1903, 26.

*A Telescopic Powder Folder* is also suggested by Mr. Hostelley, which, as shown by Fig. 7, is constructed in four sections, but may have more or fewer sections as desired. The sections are partly made of wood, but principally of metal—sheet brass. A view of one section of the folder is shown illustrating the specific make-up. The strips of wood are hard wood; they may be about $\frac{3}{16}$ inch thick. The metal is brass in thin sheet. The small brass plates are screwed to the strips of wood with brass screws short, slender and flat-headed, the heads of the screws coun-

FIG. 7.




Telescopic Powder Folder.

ter-sunk. Each section of this powder folder is a form over which powders are folded of a certain length to fit a particular box. There being four sections to the folder, it follows that powders of four different sizes may be shaped over this device, allowing each section to shape the folding of powders of a single size. But each section may be made to direct the folding of powders of two sizes; one powder may be folded over the length of the form, another over the breadth. This affords the device a capacity of eight different forms to facilitate the folding of powders.—Drug. Circ., June, 1903, 115.

*Drug Comminuters—Various Useful Appliances.*—A. E. Hiss suggests that food or meat cutters such as butchers use may be made of good service in a drug store. Drugs of a loose texture, like leaves, can be reduced to a coarse powder by passing through one of these cutters. Fruit for making crushed fruits for the soda fountain may be comminuted very easily and quickly in one of these cutters. The fruit can be reduced to almost any desired degree of fineness by changing the end plates on the cutter. Three or four end plates usually accompany each cutter. There is a cutter made for which an end plate with very small openings may be obtained. Such an implement the author uses exclusively for cutting vanilla. The vanilla comes out finely ground as fast as coffee may be ground in a coffee mill. Any one who has ever had the task of reducing vanilla beans to a suitable condition for making the tincture will appreciate what a vast amount of labor is saved by the use of such a machine. While every drug store is usually provided with a drug mill, few are provided with small

*Drug Mills*, such as are provided with a clamp at the bottom. This can be clamped on any convenient place, such as the edge of a table or the work counter, and when no longer required may be unscrewed and put away. The author finds by experience that a small apparatus like this is more likely to be used than a larger one. Then, too, it is so easy to set it up and take it down; it is never in the way; and it is large enough for most purposes. When large quantities of ground drugs are required, these are now usually purchased as such.—Bull. Pharm., Aug., 1902, 327.

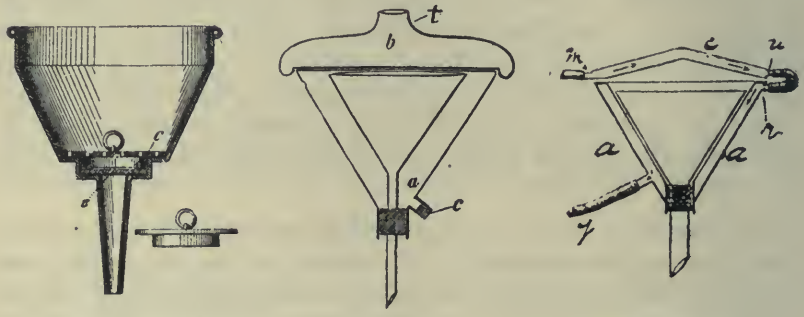
*Decoction Mugs—Use of Granite-Ware Measures.*—A. E. Hiss says that there is no good decoction mug on the market, but that an excellent apparatus for making decoctions may be made from a granite-iron one-half pint or one-pint measure—or both sizes may be kept on hand. A measure is recommended because it has a broad base; any other broad-bottomed dish of suitable size may be used instead. As these dishes are not provided with a lid, have a tinner make one, of ordinary tin, or, better, of galvanized iron. Have him put some kind of a knob or handle on top of the cover. Or the ingenious pharmacist may construct a cover out of the odd pieces of tin which are to be found about every drug store. The tin may be cut out so as simply to lie over the dish. Upon making a small hole near the knob or handle, the apparatus is completed. To use it, wrap the comminuted drug loosely in a small piece of clean cheese-cloth or muslin, tie up the opening with a long string, and allow this string to pass from the inside of the cover through the hole, finally winding it around the knob or handle of the cover. The proper amount of water is then poured into the dish, the cover put on, and the liquid allowed to boil. The string should be adjusted so that the drug swims just below the surface of the liquid. Following these directions, the drug will not be scorched and the

decoction will require no straining. The little bag may be expressed with the fingers, and if the amount of liquid is not sufficient, the bag may be moistened with sufficient water and expressed as before.—Bull. Pharm., Aug., 1902, 327.

*Filtering Funnel—A Convenient Device.*—Samuel Rudner has devised the filtering funnel shown by Fig. 8. At the neck this funnel is provided with a shallow cylindrical chamber, within which the filtering disc, *B*, is placed—this being felt or other suitable material—and kept in place by a sieve or strainer, *C*, shaped as in the smaller illustration. The strainer fits the cylindrical chamber, its extending upper surface resting upon the seat formed by the chamber—a ring attached to the strainer facilitating its removal.—Merck's Rep., April, 1903, 105.

*Ice Funnel—An Improved Device for Cold Filtration.*—Dr. T. N. Raikow has devised the ice funnel shown by Fig. 9, which possesses the advantage over the other funnels heretofore employed for cold filtration that the top as well as the sides are thoroughly chilled. The improvement

FIG. 8. FIG. 9. FIG. 10.




Filtering Funnel. Ice Funnel. Steam Funnel.

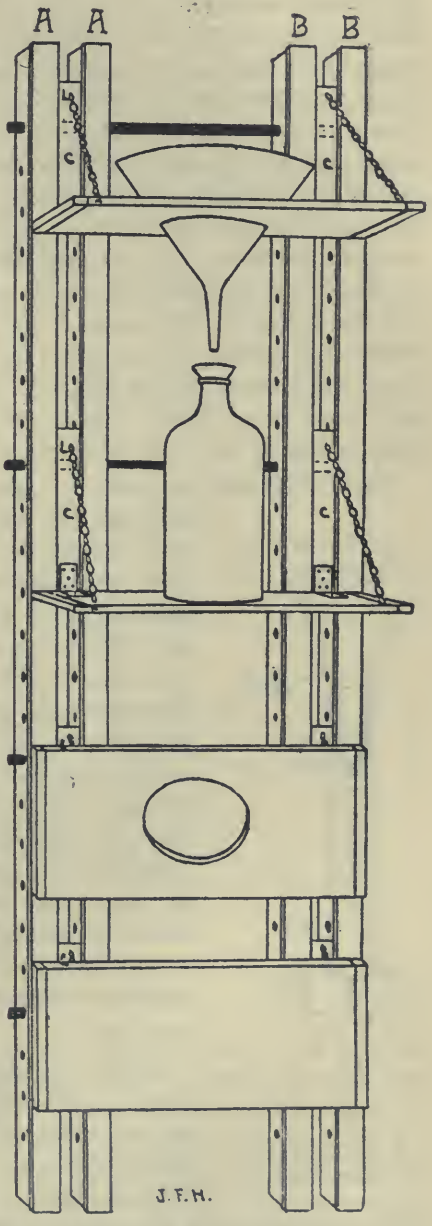
consists of a hollow vessel, shown by *b* in the illustration, which, also filled with the frigorific mixture through the aperture *t*, is placed like a cover on the funnel. The funnel containing the liquid to be filtered should be raised up until its margin is just below *b*. The space *a* between this funnel and the outer one is filled with the freezing mixture, which may be drawn off through the side-tube *c* when desired.—Merck's Rep., October 1902, 395; from Chem. Ztg., xxvi, 732.

*Steam Funnel—A Device for Filtering Hot, Inflammable Liquids.*—T. N. Raikow has also devised the funnel shown by Fig. 10, which is intended for filtering hot, inflammable liquids. In this funnel the steam coil usually employed is superseded by a funnel with double walls, *a a*, made of copper or nickel, and provided with two tubes, *q* and *r*. A double-walled cover, *c*, completes the arrangement. The cover has a slightly conical form, and is also provided with two tubes, *m* and *u*, at opposite sides, the one being con-

nected with the tube *r* by means of a piece of rubber tubing, the other being connected with the steam-generating apparatus. As will be seen, the steam is thus made to circulate above and around the liquid in the glass funnel inserted in the double funnel, and escapes through the tube *q*.—Merck's Rep., Nov., 1902, 439; from Pharm. Ztg., 1902, 726.

*Adjustable Wall Filter Rack—A Contrivance for Narrow Quarters.*—Joseph F. Hostelley has devised the adjustable wall filter rack for narrow quarters, shown by Fig. 11, which is of inexpensive design and admits of home construction. In height this rack may be made to take advantage of the full possibilities of the wall against which it is to stand or it may be fashioned only a few feet in height. The four upright strips A, A, B, B, are of pine or poplar wood, 1 inch by 1½ inches. The space between the first two strips to the left, A, A, is about 1 inch; between the two strips B, B, the same distance intervenes. A, A, and B, B, are about 6 inches asunder. The black elliptical markings down the side of each strip indicate holes of about ⅜ inch bore, introduced at regular and equal distances; a slender iron rod passed through any one hole in an outside strip will justify with holes in the three other strips. The characters c, c, c, c, designate narrow blocks of wood about 12 inches long, of a width that will just allow them to move up and down between the strips that guide them. A ⅜ inch hole bored through each block near the upper end allows the rod to pierce them and hold them in position as adjustable supports

FIG. 11.

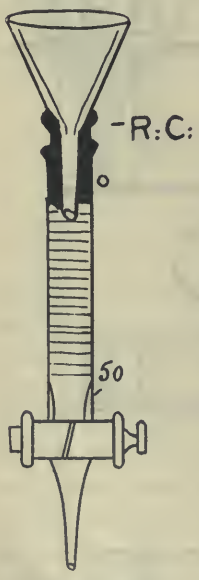



Adjustable Wall Filter Rack.

for the shelves, as made evident by the drawing. It will be seen that the shelves are hinged—strongly hinged—to the lower end of these blocks, and that from the upper end of each a piece of desk chain, secured by a small screw-eye, or by a plate eye screwing to the block, runs to an outer corner of the shelf, where it is made fast in a similar way. This arrangement perfectly and securely supports the shelves when down and in use, and allows them to be folded up out of the way when not employed. Across the face of each erect piece, the full length of it, there should be nailed $\frac{3}{16}$ strips of wood projecting about $\frac{3}{16}$ inch over the space between each pair of uprights. For instance, to the face of uprights A, A, which are 1 inch wide, strips of wood $\frac{3}{16}$ inch thick, $1\frac{3}{16}$ inch wide as long as the uprights, are nailed, $\frac{3}{16}$ inch projecting beyond the inner side of each upright. The perpendicular pieces standing against the wall, a slot is in this way formed for the passing up and down of the blocks c, c, c, c, from which they cannot escape; there is just sufficient play for them to be raised and lowered with no binding. Either the filter or receiver shelves may be set at any desired height, the possibilities of elevation being restricted only by the height of the rack itself.—Drug. Circ., May, 1903, 94.

*Rapid Filtration Apparatus—Convenient Construction.*—F. H. Alcock describes the simple apparatus shown by Fig. 12, which has received much favor where cold liquids are concerned, and it has moreover the advantage of being available for delaying the passage of the solvent in washing precipitates and thus lessening the quantity of wash water. This is effected by regulating the flow by the stop-cock of the burette. For such precipitates as the magnesium ammonium phosphate and arsenate it is good. Over the stem of the funnel is fitted a piece of rubber tubing (R. C.) about one inch long, and this is made to fit tightly into the mouth of the (50 Cc.) burette; careful adjustment of the filter-paper into a non-ribbed funnel, with or without a strengthening cone of calico, perforated parchment paper, or the usual platinum cone—these are all the requirements.—Pharm. Journ., Dec. 20, 1902, 666.

FIG. 12.



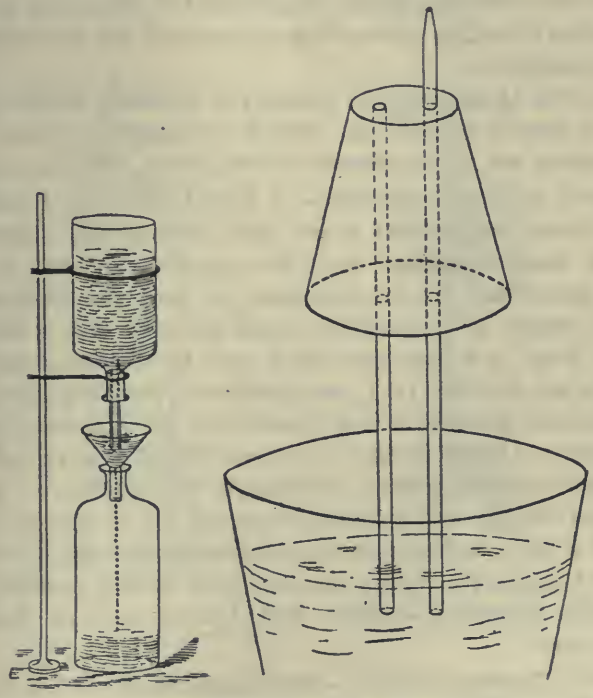

Rapid Filtration Apparatus.

*Filtrate Receivers—Utility of Precipitating Jars.*—Joseph F. Hostelley wonders why precipitating jars are not more commonly used about the store as filtrate receivers, etc. A funnel may be set well within the wide orifice of the jar without fear of being easily overtipped as in the case of filtering into a common bottle, and the funnel itself forms a protection from dust for the filtrate in the jar. The one-half gallon and one gallon jars have an opening four inches in diam-

eter, while the two-gallon jars measure six inches across the mouth.—Drug. Circ., Febr., 1903, 27.

*Automatic Filter Supply—Simple Apparatus.*—Newton Spyer has constructed the apparatus shown by Fig. 13, which, while not new in principle, seems to possess some novelty in device. It consists of an india rubber stopper pierced by two pieces of glass tubing three inches or so in length, one projecting a little further through the stopper than the other, and terminating in a point. A quarter of an inch from the other end of this piece of tubing a side hole is cut. This apparatus is inserted in the neck of the bottle containing the liquid to be filtered, and this is inverted

FIG. 13.



Automatic Filter Supply.

over a filter, so that the glass tubes are below the level of the filter rim. The liquid rises in the filter to the level of the side hole in the tube, when the outflow is automatically checked. The liquid sinks to the level of the ends of the tubes, and a gentle stream of air begins to pass up the side-hole tube and again fills the filter until automatically checked as before. The rise and fall of liquid in the filter being limited to the quarter inch between the side hole and end of tube, this saves the necessity of "feeding" the filter, or of fearing that the filter will overflow.—Pharm. Journ., April 11, 1903, 552.

*Washing Precipitates on Filters—Relative Effect of Large and Smaller (more frequent) Additions of Wash-liquid.*—George Frederick Hornby observes, as a result of experiments on filtration, that if two precisely similar precipitates be washed on two precisely similar papers and funnels, for exactly one minute in each case, the one by means of fifty-minute additions of water, the other by means of five much larger additions; then, in spite of these different conditions, and in spite of the fact that the total washing liquid used will be quite different in the two cases, still the precipitates will be left contaminated with precisely the same amount of impurity. The practical application of the author's observations is given as follows:

1. If we wish to use the minimum quantity of wash-liquid, we must keep the quantity of liquid upon the fifter-paper small throughout.

2. The time of working cannot be quickened or delayed by any changes in the method of adding the wash-liquid, provided the upper edge of the paper be attended to.

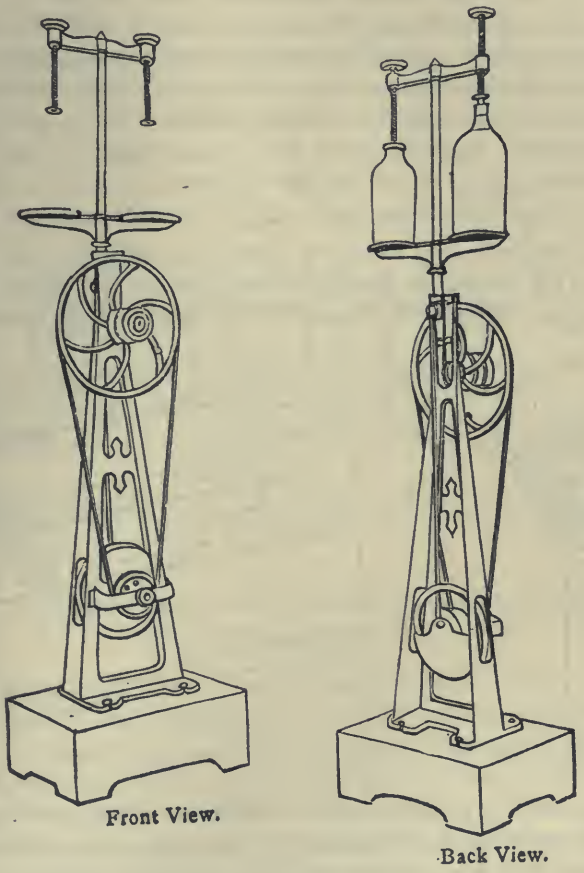
3. If we wish to minimize the drudgery of filtration, we will make each addition as large as possible and allow the precipitate to drain. But the time of washing will not be affected.—Chem. News, May 15, 1903, 237.

*Separatory Receiving Apparatus—A Useful Device in Distillations.*—Dr. Leo Glaser recommends a new style of separatory apparatus said to possess many advantages over the separatory funnels in common use, and particularly for the separation of immicible distillates. The apparatus consists of a separatory funnel provided with a stop-cock as usual, and fitted to a flask, into which, near the bottom, a stop-cock is sealed. In use the liquid (*e. g.*, the distillate in preparing oil of rose) is, on condensation, allowed to drop directly into the separatory funnel, and when the latter is nearly full, the lower, heavy liquid is let run off by opening the stop-cock and without interrupting the distillation. It will be readily seen that, by this mode of procedure, loss of perhaps invaluable material is avoided, as the apparatus obviates the necessity of transferring a distillate from the receiver to the separatory funnels ordinarily used, in order to affect separation.—Merck's Rep., January, 1903, 17; from Pharm. Ztg., 1902, 938.

*Laboratory Shaking Machine—Modification of the "Milk-Shaker."*—Gerald D. Moody describes the shaking machine, shown in front view by Fig. 14, and in back view by Fig. 15, which is a modification of the "American Milk-Shake Apparatus," and well adapted for laboratory operations requiring shaking. The machine consists of a cast-iron standard, which carries two bored, parallel brackets 3 inches apart, and through these passes a vertical working rod. To the top of the rod is attached an iron framework, comprising a central stem to which are fixed, at the lower end, a cast double bracket on which the bottles, etc., rest, and at the upper end a double bracket carrying tightening screws. This framework and the vertical rod are given vertical motion by means of an iron con-

necting-rod, at the upper end fastened to the working-rod by a pin-joint; at the lower end given rotary motion by a crank-pin affixed to a small cast-iron balanced fly-wheel. The fly-wheel is attached by a set screw to a horizontal shaft supported by the iron standard, and carrying a cast-iron V-pulley about 3½ inches in diameter. Motion is transmitted to this pulley by means of an 11½-inch grooved hand-wheel and round leather

FIG. 14. FIG. 15.



Front View. Back View.

Laboratory Shaking Machine.

belt, the hand-wheel running on a fixed horizontal shaft, bolted to the standard, and having vertical adjustment. To use the machine for shaking, the bottle or other containing vessel is placed on a felt pad on one of the arms of the moving frame, and held down by the tightening screw, between which and the bottle-stopper is placed an india rubber bung.—Chem. News, Nov. 7, 1902, 230.

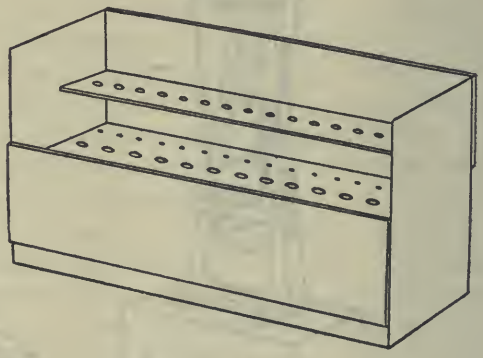
*Test Tubes—Practical Application in Dispensing.*—A. E. Hiss observes that the test-tubes, though ordinarily used only for the testing or examination of chemicals, may be put to other services. If a small amount of extract is to be dissolved in water, the extract may be placed in a mortar and triturated with a little water which has just been heated to boiling in a test-tube. As little as a few drops may be heated in this manner. The source of heat may be an alcohol lamp or a gas burner. If the latter it may be a Bunsen burner or an ordinary illuminating flame. To avoid staining the test-tube with soot when using the latter, it should be held just above the colored portion of the flame. The beauty of this method of obtaining hot water is that the exact amount desired is obtained, and that the time required is almost infinitesimal. If 30 minims of liquid are desired, this amount is to be measured in a minim graduate, then poured into a test-tube and heated. As much as two, four, or even eight drachms of liquid may be heated quickly in this manner by having on hand a small assortment of test-tubes of different sizes.—Bull. Pharm., Aug., 1902, 326.

*Funnel Test-Tube—A Convenient Device for Clinical Urine Testing.*—L. Jacobson has devised the funnel test-tube shown by Fig. 16, for facilitating clinical testing of urine. It consists of a test-tube around the upper out-

FIG. 16.

Funnel Test-Tube.

FIG. 17.



Test-Tube Case.

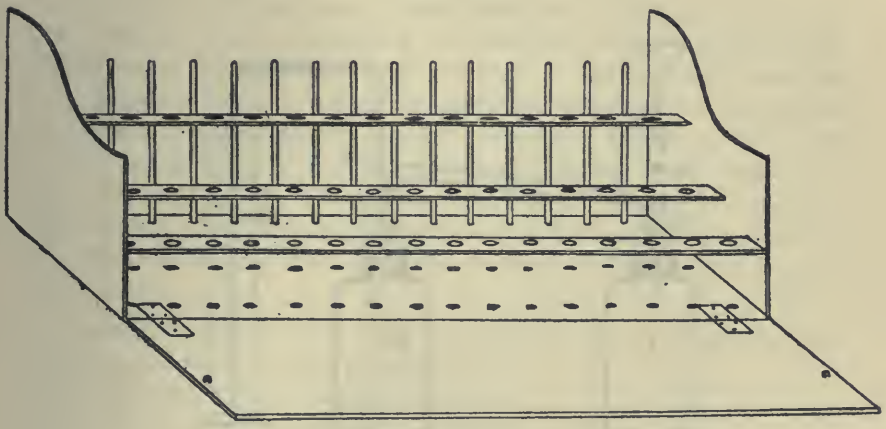
side part of which is sealed a funnel. Where the funnel joins the test-tube 6 to 10 very small holes are provided. The apparatus is used as follows: To apply the nitric-acid test for albumin a few cubic centimeters of nitric acid are first poured into the test-tube; some of the urine is then poured into the funnel, and, passing through the very fine perforations, runs slowly and evenly down the inside of the test-tube, thus overlaying the acid and yielding a very sharply defined zone where the slightest trace of albumin may be detected, it is said, with the greatest ease.—Merck's Rep., October, 1902, 396; from Pharm Ztg., 1902, 627.

*Test-Tube Case—Convenient Device.*—Joseph F. Hostelley describes

the test-tube case shown by Fig. 17, which is intended to protect test-tubes and their contents from dust when not in actual use. It closes, taking the form of a box. The top is hinged at the back and folds over the back of the case. A section of the front is hinged so as to drop down in front. This opens the box sufficiently to allow free use of the test-tubes in the racks within. A little catch holds the two hinged sections together when the case is closed. This might be made from one of the many little packing boxes that come into the store.—Drug. Circ., Feb., 1903, 26.

*Drawer Test-Tube Rack—Convenience and Advantages.*—Joseph F. Hostelley suggests the test-tube drawer rack, shown by Fig. 18, which, as its name implies, slips into a stall in a fixture in the same way as does an ordinary drawer. The face of the rack is hinged to the base so that it

FIG. 18.



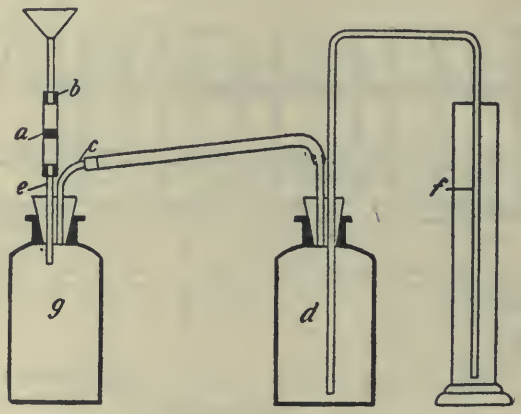
Drawer Test-Tube Rack.

may drop down to lie flat on a work bench or shelf. When it is up to form the front of the "drawer" it is secured in position by two tiny catches on the inside, one on either end. One advantage of this unusual rack over the common kind is, that when it is out, a vacant space in the fixture from which it was taken speaks so significantly of something lacking or something left undone, in all probability, that just so soon as an operator is through with the rack, he replaces it.—Drug. Circ., June, 1903, 115.

*Apparatus for Gasometric Analysis—Construction and Use.*—Two years ago (see Proceedings, 1901), Frank X. Moerk described a simple and inexpensive apparatus for conducting gasometric analysis, which has given good satisfaction for the estimation of nitrites, but for urea, hydrogen dioxide and chlorine estimation, the use of the homeo-vial had been found a source of more or less trouble, and this has, therefore, been superseded

by transferring the funnel-tube from the reservoir *d* to the generator *g*, as shown in the accompanying cut of the modified apparatus (Fig. 19). The small tube *e*, to which the funnel-tube is attached, should project about one-half inch below the lower surface of the cork, otherwise it may happen that in allowing liquids to enter through this tube some may be carried along the cork and escape into the exit tube *c*, causing loss. In preparing for a determination, the following order should be observed: Disconnect apparatus at *c* and remove stopper from *g;* charge the generator *g* with the specified materials; adjust the funnel-tube by filling the funnel with the proper liquid and by compressing the rubber tubing at the position of the small glass plug *a*, allow the liquid to fill the small sections of rubber and glass tubing and displace the air (when this has been accomplished, allow the liquid to drop from the glass tube until the liquid in the funnel is on a level with the upper end of the rubber tubing *b*); replace the cork

FIG. 19.




Apparatus for Gasometric Analysis.

in the generator; fill the reservoir *d* with water after removing the stopper, replace the latter and place the outer end of the siphon-tube *f* into a vessel containing water; by applying suction at *c* this siphon-tube can and must be perfectly filled with water, although it is not necessary to have *d* perfectly filled; connect the two bottles at *c* and remove the siphon-tube from the vessel containing water; see that the apparatus does not leak by watching the siphon-tube; should this, by a slow dropping of water, indicate a leak, this can generally be stopped by pouring a little water over the corks; place the siphon-tube in the vessel used to collect or measure the water displaced by the gas evolved in the experiment; if this vessel is graduated it should be dry at the beginning of the experiment; if, on the other hand, it is not graduated, rinse it with a little water and allow to drain before using. By this precaution the quantity of water used to moisten the vessel, and which would be lost in transferring to a graduated vessel, is first added.

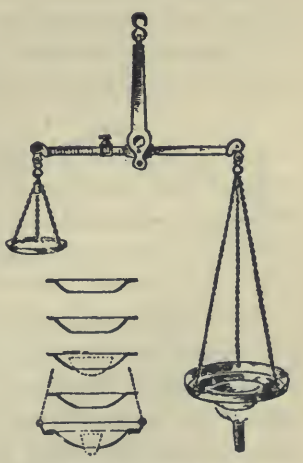
The author gives a detailed description of the various gasometric operations indicated above, and of the precautions necessary to assure accurate results, which must be consulted in the original paper, in Proc. Pa. Pharm. Assoc., 1902, 120–124.

*Platinized Aluminum Vessels—Method of Making.*—A. Gawalowski describes a method of readily platinizing aluminum vessels so as to make them available for evaporating water for chemical analysis. An alkaline solution of platinum, prepared by adding sufficient caustic potash solution to a 5 or 10 per cent. solution of platinum chloride to slight alkaline reaction, to phenolphthalein, is simply applied to the bright, polished surface of the aluminum vessel. Such platinized vessels should not be cleaned by scrubbing with sand, but may instead be rinsed with a 5 or 10 per cent. solution of oxalic acid. Amer. Journ. Pharm., March, 1903, 143; from Ztschr. f. Anal. Chem., 1902, 618.

*Casseroles and Evaporating Dishes—Efficient Substitutes.*—A. E. Hiss calls attention to the advantage of the casserole over the porcelain evaporating dish. Being provided with a handle it may be readily removed from the fire. Better yet than the porcelain casserole is a well-glazed granite-iron dish of small size, having a projecting handle. This is just as good as the casserole, and is in no danger of fracture. He makes considerable use of granite-iron dishes, employing the best grade of ware. The principal objection to these dishes is that the enameling is liable to chip off, and then the dish is ruined for many purposes.—Bull. Pharm., Aug., 1902, 327.

*Evaporating Balance—A Convenient Device.*—Franz Hugershoff has constructed a balance which is intended for weighing liquids while in process of evaporation. The general arrangement is clearly shown by Fig. 20, one pan of the scale being replaced by a ring in which several smaller rings are fitted, and in which, in turn, dishes, crucibles, etc., containing the liquid to be evaporated, may be placed, and heated by a Bunsen burner or other suitable means, without removal, until the specific weight desired is attained.—Merck's Rep., Oct., 1902, 395; from Pharm. Ztg., 1902, 626.

FIG. 20.

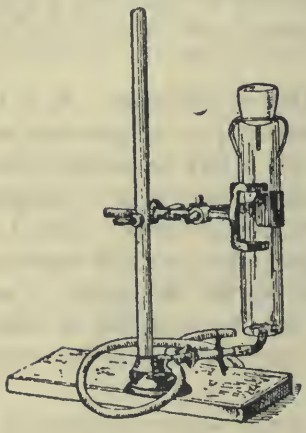


Evaporating Balance.

*Substitute for the Water-Bath—A Convenient Device.*—P. Zimmerman describes a simple substitute for a water-bath, shown by Fig. 21, which is constructed readily as follows: Fasten a glass chimney about 25 Cm. long and 5 Cm. in diameter, in a stand, and over its upper opening place

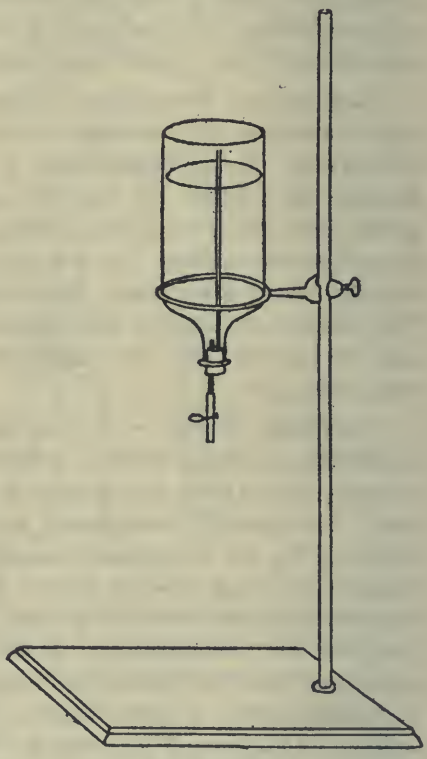
a wire triangle, as shown. On this triangle place the dish containing the liquid to be evaporated. Into the lower opening of the chimney insert the tip of a Bunsen burner, the opening of which is covered with a piece of wire gauze to prevent the flame from "striking back." The evaporation is effected by means of a very small flame, in a current of hot air, and with a very economical gas consumption. The temperature of the liquid never rises above 90° C. By means of this apparatus 300 Cc. of water may be evaporated in 10 to 12 hours, it is stated. Furthermore, as the evaporation proceeds in a current of hot air, no loss from spirting need be feared.—Merck's Rep., Sept., 1902, 357; from Pharm. Ztg., 1902, 559.

FIG. 21.



Substitute for the Water-Bath.

FIG. 23.



Bottle Filler.

FIG. 22.

Pill Tile Holder.

*Pill Tile Holder—A Practical Device.*—Joseph F. Hostelley uses two little devices like the one shown in Fig. 22 to assist in firmly holding a pill or ointment tile so that it may not slip on the counter when a pill mass or an ointment is being manipulated thereon. The affair as illustrated consists of a small triangular piece of thin board cut to fit a corner of the tile, with slender square strips of wood nailed along the lines of the shorter angle. These strips are of the same thickness as the pill tile.

Two little iron pins (wire nails will answer) are driven through the triangular piece and the strips beneath to project about three-fourths of an inch, as seen in the diagram. These pins fit tightly into small holes drilled in the prescription counter at a point convenient for the prescriptionist. It will be readily perceived that when this is done, a perfect support is realized for one corner of the tile, and that if two of these devices are employed at the left and right hand corner farthest from the operator, by pressing the tile against them with the disengaged hand, a rigidity of the tile is realized that will greatly facilitate the operation of incorporating an ointment or rolling a pill-cylinder.—Drug. Circ., Febr., 1903, 26.

*Bottle-Filler—A Convenient Device.*—Joseph F. Hostelley suggests the arrangement, shown by Fig. 23, for expeditiously and cleanly filling small bottles with a liquid from a one or two-gallon bottle. The large bottle is fitted with a good, sound cork or rubber stopper having two perforations; through one of these holes a piece of glass tubing is passed long enough to reach nearly to the bottom of the bottle and to slightly project beyond the cork on the outside; through the other perforation is passed a shorter glass tube, flush with the inside of the cork and projecting two or three inches beyond it on the outside. To the latter tube a finger's length of rubber tubing is attached, nipped by a Mohr's pinch-cock. The bottle is then supported in an inverted position at a convenient height above the work bench or table. The small bottle to be filled is held in the right hand beneath the projecting tube, the latter entering the bottle a trifle, perhaps; with the left hand the pinch-cock is released until the bottle has become filled, and then allowed to tighten on the tube again. The longer glass tube entering the bottle nearly to its full length supplies it with air to accelerate the outflow of its contents. When the filling-tube is of small bore and the liquid dense, this air-tube fills an indispensable mission. A small vessel is placed on the work bench to catch drippings from the filling tube.—Drug. Circ., June, 1903, 114.

*Corks—Coating with Gum Arabic for Volatile Oil-Fractionation Apparatus.*—T. H. Page, calling attention to the rapidity with which rubber stoppers are rendered useless when exposed to the action of volatile oils during fractionations, states that ordinary corks, coated with a thick mucilage of gum, are an admirable substitute for rubber stoppers. The mucilage is applied with a brush to the cork before insertion and then several coats are given to the joint after the apparatus is connected. Big holes, which sometimes occur in the cork, are best stopped with shellac or gum, slightly softened in water. The gum is not affected by the terpenes, but, hardening as the distillation proceeds, forms a perfectly air-tight covering for the cork.—Pharm. Journ., Mar. 7, 1903, 349.

*Parchment Paper—Application as a Bottle Wrapper.*—Joseph F. Hos-

telley observes that the use of parchment paper as a bottle wrapper for pharmaceutical specialties is coming to the fore. There are several practical methods for manipulating this paper, but moisture is the key-note of them all. To adapt itself to the contour of the bottle without unsightly wrinkles and blisters, the paper must be wrapped with the grain in it running parallel with the bottle. The reason for this is manifest, the paper being manipulated with moisture, following the principle of expansion and contraction. Its application as a wrapper is as follows: With a flat paste-brush about four inches wide the surface of a sheet of plate glass is thoroughly wetted with water containing just a suggestion of flour paste. A sheet of the parchment paper is laid over this, the upper surface moistened with the brush, then stretched and smoothed out perfectly flat with the fingers and the palm of the hand. The bottle to be wrapped is laid on the paper and the latter drawn evenly over it, pleated over the base and worked in about the shoulder and neck to lay closely, with the hand and fingers. The bottle is now set aside for the paper to dry without further attention. If this is all done carefully, the paper when fully dry will be found to lay evenly and tightly over the body of the bottle with few, if any, wrinkles. In wrapping a large bottle of a capacity of five pints or one gallon it will be found advantageous to tightly wind strips of cloth around the shoulder and neck to cause the paper to better take the shape of the bottle and to retain its position until dry. Not until the moisture has entirely left the paper are the strips to be removed.—Drug. Circ., Feb., 1903, 26.

*Cotton Rack—Convenience.*—Joseph F. Hostelley suggests that an ordinary sponge rack of tinned-iron wire, such as is common to the bath room of the home, makes a capital holder of absorbent cotton, if hung on the inside of an upper closet door, or in some convenient locality where dust will not reach it. The distance between the wires of the frame being nearly an inch, the cotton may be nicely pulled through the rack in small pledgets as needed for filtering, etc., without disturbing the body of the cotton. The rack may be hung anywhere handy if a cloth cover be made for it that will fasten to the back and hang over the top and front to protect the cotton from dust.—Drug. Circ., Feb., 1903, 27.

*Barrel Covers—Convenient and Cheap Construction.*—Joseph F. Hostelley recommends covers for protecting the contents of barrels from dust and flying insects, to be made in the following way: Select a perfect hoop from a sugar barrel that is a trifle larger in diameter than the top of the barrel to be covered. If this can not be easily done, make a large hoop as much smaller as necessary by cutting it and drawing the two ends together to lap one over the other, fastening them with wire nails. Over this hoop stretch a circular piece of white muslin or canvass and tack it closely all around the edge. This provides a dust- and fly-proof cover light in weight and at little cost.—Drug. Circ., Feb., 1903, 27.

*Etching on Glass—Detailed Process and Manipulation.*—While the property of hydrofluoric acid to attack glass (silica) and its consequent utilization for etching characters on glass vessels is generally well understood, the following description of the process communicated by Lionel Waters, may prove interesting and useful to pharmacists in the average drug store:

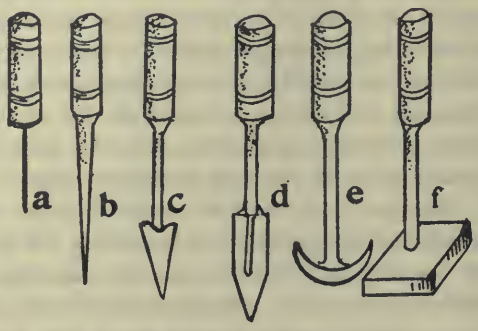
The article to be etched is first covered with paraffin; if a small article it is entirely covered, if a large one only those parts within a radius of, say, a few inches of the part to be etched need be so covered. To do this any method may be resorted to which is convenient. A sufficient, though small amount of paraffin, beeswax, spermaceti or white wax is melted over a flame in a tin or other vessel (the lid of a can answers admirably), and the melted wax is painted over the glass by the use of a brush or swab, made by tying a tuft of absorbent cotton to the end of a stick of wood. The article is then set aside to allow the wax coat to harden. Meanwhile the arrangement for producing the hydrofluoric acid is set up. Since the acid would attack glass or porcelain vessels, vessels of these materials cannot well be employed to hold the mixture used in producing it; hence vessels made of some metal that is not affected are employed. Lead answers best, and a suitable vessel of any desired shape can readily be hammered out of a piece of common lead pipe. This can be made into a shallow trough or dish of such a form that the object to be etched will rest on its edges, so that the parts of the glass that are exposed can be readily acted upon by the fumes of the acid that are liberated later. Upon the bottom of this dish is spread a layer of powdered fluorspar and all is ready to commence the evolution of hydrofluoric acid, this being effected by simply wetting the powder with sulphuric acid. Meanwhile the protecting wax must be removed from such parts of the glass object as it is desired to etch. This is done by scraping in the design by means of any sharp-pointed instrument, such as a large, stiff needle, knife point or the point of a file. The shavings of paraffin so removed are brushed off carefully by means of a camel's hair brush or a tuft of cotton. As much concentrated sulphuric acid is poured on the fluorspar in the lead dish as will suffice to thoroughly moisten it; the object to be etched is then laid over the dish with the side containing the design down, when the fumes of the hydrofluoric acid which are gradually evolved will cut into the glass wherever it is exposed. The etching will be complete in the course of an hour or so, though, if not needed at once, it is well to allow the article to remain some hours—say, over night. The wax is then removed by scraping, warming and rubbing with a towel, when the design will be found to be neatly etched in the glass. At times when the wax sticks tenaciously it may be easily removed by softening with a little benzin.

Since the fumes of the hydrofluoric acid are very irritating and poisonous, care should be taken not to inhale them. The common practice is

to take the whole apparatus out into the open air, or on the roof, where it will not be disturbed, as soon as the action is started, and allow it to remain there until the action is completed.—Amer. Drug., April 15, 1903, 186.

*Borneo Labels—Peculiar Forms and Methods of Making.*—Geo. B. Rice, during a visit to some soap and perfume works of Borneo, had his

FIG. 24.




Tools for Making Borneo Labels.

attention attracted to some peculiar forms of labels. These labels are made in several distinctive ways, some being imprinted from patterns obtained by a peculiar method to be described, direct upon the soap; others are made by burning on wood, plush or leather, by means of heated tools, a set of which is shown by Fig. 24. It includes tools which are made on

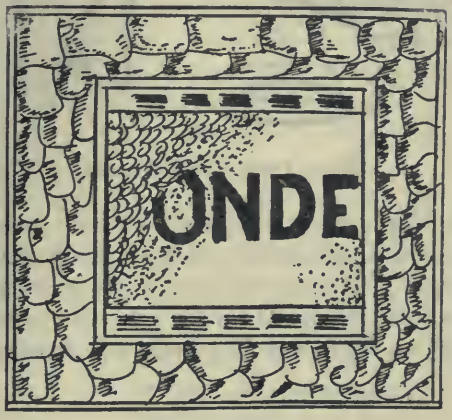
FIG. 25.

Borneo Label.

the principle of the soldering iron. In fact, a soldering-iron point could be used for this process. The common pointed tool for producing light lines is shown at *a*. For a little coarser work the tool *b* is used. For

very coarse work the tool *c* is utilized. This tool, like that in *d*, has a solid metal end, which holds the heat well, and the point is thus kept at the proper temperature for working effectively. At *e* is a sketch of one of the tools with an oval end for the purpose of making curves. The tool *f* is for imprinting over more extensive surfaces. Sometimes engraved platens or pads are used and applied hot to the article which it is required to mark. The natives are very artistic in some of the lines of labels made by them. The fantastic is sought for in every case. The native merchant has an eye to elaborate patterns, and he chooses those in which there are scrolls and angles in considerable proportion. Examples of such labels are shown by Figs. 25 and 26. The heating of the tools in order that the

FIG. 26.



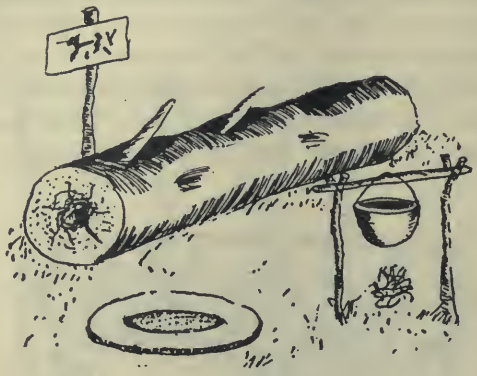

Borneo Label.

proper designs may be executed is done in a very simple manner by the natives. Sometimes they merely cut a hole in the ground and place a few stones about it, heating the iron by building a wood or charcoal fire therein. Sometimes a stovepipe affair is used, about eight inches in diameter, and about twenty inches long, and the fire is made within this metallic cylinder. Others resort to the cooking stove, and heat the irons there.—Drug. Circ., July, 1902, 136.

*Moro Drug Compounding—Interesting Description.*—"An Eastern Traveler" gives an interesting description of the methods and mechanical contrivances used by the drug compounders in the territory of the Philippine Islands occupied by the Moros; these compounders furnishing herbs, pulverized minerals and colored woods for medicinal purposes, and operate what might be called a drug supply store. The author found quite a number of the Moro doctors and compounders of drugs located in the open, with an outfit very like that exhibited in Fig. 27. They establish one of these compounding places on market days at different centers and sell the

drugs as required. The drugs consist of dried roots of trees and plants, minerals, pulverized snake skins, etc. The variety of barks used is endless. Leaves are selected and often crushed and the juices used. Often poisonous plants are carelessly applied, resulting in great injury to the

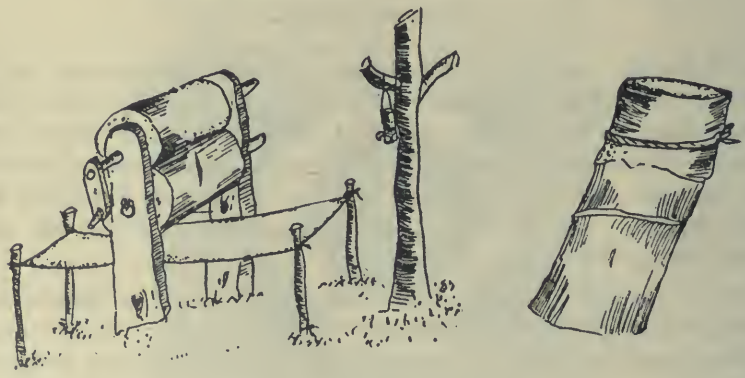
FIG. 27.



Moro Drug Compounding.

patient. In the drug-compounding outfit referred to a common log of wood is used, in which are gouged out one, two, three or more bowls, to be used as mortars. As many different kinds of drugs may be mixed simultaneously as there are cavities in the log. One often sees a native at each cavity pounding medicines for patrons who stand patiently by wait-

FIG. 28. FIG. 29.



Moro Drug Compounding.

ing for the mixture. One of the crushing devices of the Moro drug-mixer is shown by Fig. 28. It consists of a pair of very hard and smooth wood rolls, fitted in strong bearings of wood, the latter being sunk deeply into the earth to get a secure grip. The rolls are revolved by a hand crank,

and as they are turned another native feeds the material to be crushed into the bite of the rolls. As fast as crushed the stock falls to the fabric spread below and is caught. Sometimes the stock is run through several times before it is properly divided. For retailing the medicines tubes of bamboo (Fig. 29) are used. They are about an inch or two in diameter and six or eight inches long, the natural partition forming the bottom, while the mouth is covered with skin secured with a cord, as shown. For other interesting details see Drug. Circ., April, 1903, 73.

*Prescription File—A Home-Made Contrivance.*—M. K. Barber gives the following directions for making a useful and compact prescription file from a cigar box—the short, tall kind, holding 100 cigars: Saw a block of wood so that it will fit loosely in this box, making it about half an inch shorter and narrower than the inside of the box. Make this out of ½- or ¾-inch wood. With a small gimlet bore two holes through the block, one about a half-inch from one end of the block and an equal distance from either edge, and the other about an inch from the first hole and toward the center of block. Get a piece of small fence wire, not too heavy to bend easily, yet heavy enough to easily retain its shape when subjected to some strain. File off a piece about 12 inches in length, slightly sharpen one end, and bend (a pair of pliers will greatly aid) the other end so that there will be formed a hook in the shape of the letter U with a short arm about an inch and a half long. The distance between the long and the short arms should be that between the two holes in the block. Draw the wire through the block with the long arm through the hole nearest the edge of the block, and the short arm through the other. Place the block on a solid base and hammer the protruding end of the short arm over toward the long one until it is flush with surface of the wood. Then remove your prescriptions from your desk file onto this one, placing the lowest number on the bottom. When the box is thus filled—say to 1000—the wire is bent over so that the top of the box will close. When a prescription is needed, lift out the pad by means of the wire, and turn all the prescriptions above the one wanted around on the wire. You then have your prescription before you in such form that you can easily place it where most convenient on the dispensing counter.—Bull. Pharm., Nov., 1902, 456.

## B. Preparations.

### ACIDA.

*Aromatic Sulphuric Acid—Sulphovinic Acid a Constituent.*—The statement by Professor Attfield in the 17th edition of his "Manual of Chemistry" (p. 367), that he has been unable to detect the presence of sulphovinic acid in aromatic sulphuric acid, is so contrary to what might be expected, and to the statements made in other authoritative works, such

as the U. S. Pharmacopœia and Caspari's and Remington's Treatises on Pharmacy, that Leonard Dobbin concluded to settle the question by actual experiment. As a result, he conclusively shows that aromatic sulphuric acid invariably contains sulphovinic acid, the quantity being dependent on the age of the sample, as well as on the temperature to which it may be exposed. Thus in a sample of acid only four days old, the quantity of barium sulphovinate obtainable from ten fluidounces did not amount to over half a grain, but when the acid was allowed to stand two months, it amounted to about two grains, while a very old sample—of unknown age—yielded from the same quantity, by the same process of treatment, forty-eight grains of barium sulphovinate.—Trans. Brit. Pharm. Confer., 1902, 386–388.

AQUÆ.

*Aqua Hydrogenii Dioxidi—Assay of Commercial Samples.*—W. H. Blome has examined eight samples of hydrogen peroxide and found them to contain the following volumes of available oxygen, respectively: 12.77, 11.19, 9.64, 9.6, 8.95, 8.15, 8.1 and 7.01 vols. Considering the instability of this preparation, none of these samples can be considered very poor—the U. S. Pharmacopœia requiring that it shall contain about 10 vols.—Proc. Mich. State Pharm. Assoc., 1902, 56.

*Solution of Hydrogen Peroxide—Reliability of the Commercial Sorts.*—Robert C. Purcel, basing his opinion on an experience of several years in the assay and manufacture of solution of hydrogen peroxide, does not believe that this solution can be prepared profitably in a small way. Furthermore, the official process, requiring the use of phosphoric acid, does not yield a product that assays 10 volumes of available oxygen. He finds the product supplied by reputable manufacturers to be usually quite reliable. Nearly all of them bottle it from one-half to one volume above what their label calls for, so that even after it has been kept quite a while it may still conform with their label. Four different makes were obtained, assayed the day they were received, recorded and kept in the cellar for about six months; they were then assayed with the following results:

| No. | Labelled. | Assayed. | Assayed (after keeping 6 months.) |
|---|---|---|---|
| 1 ..... | 15 volumes available oxygen. | 15.5 volumes. | 13.5 volumes. |
| 2 ..... | 10 " " " | 10.5 " | 8.75 " |
| 3 ..... | 10 " " " | 10 " | 8 " |
| 4 ..... | 10 " " " | 12 " | 10.5 " |

No. 4, after standing the above-mentioned time, was still as strong as the maker claimed it to be. The author believes that if the cork is removed from a package containing hydrogen peroxide as soon as obtained from the manufacturer, and a piece of absorbent cotton inserted, it will keep better.—Proc. Pa. Pharm. Assoc., 1902, 143.

*Mineral Waters—Determination of Hardness in the Presence of Magnesia.*—W. Peters recommends a method for determining the hardness of waters containing magnesia which appears to be a modification of Hehner's method. 100 Cc. of the water are neutralized with $\frac{N}{10}$ hydrochloric acid at boiling temperature, using alizarin as indicator. This gives a measure of temporary hardness, since the neutralization of the acid depends upon the presence of magnesium and calcium carbonates which are precipitated by boiling the water. The neutralized water is then treated with an excess of equal parts of $\frac{N}{10}$ solutions of sodium hydroxide and carbonate, boiled a few minutes, allowed to cool, made up to 200 Cc. with distilled water, and filtered. In 100 Cc. of the filtrate the excess of alkali is determined by titration with $\frac{N}{10}$ hydrochloric acid, using methyl-orange as indicator, and from the amount of alkali found the quantity consumed in precipitating the magnesium and calcium salts as carbonate may be calculated.—Apoth. Ztg., 1903, 25.

*Mineral Waters—Volumetric Estimation of Sulphuric Acid.*—L. W. Winkler recommends a method for the volumetric determination of sulphuric acid which is based upon the following facts: Sulphuric acid is precipitated by a hydrochloric solution of chromate of barium. The excess of chromate being precipitated in its turn by neutralization, the chromic acid displaced by the sulphuric acid is determined colorimetrically, by comparison with a titrated solution of chromate of potassium. The solubility of the chromate of barium in a neutral solution not being negligible, the necessary correction is determined by the equality of the tints between a known solution of chromate of barium and the equivalent typical solution of the salt of potassium. The method of procedure is as follows: To 150 or 200 Cc. of the water under examination, we add 5 or 10 drops of fuming hydrochloric acid, then 0.1 to 0.2 Gm. of chromate of barium; boil, neutralize with soda after cooling, then filter. Take 100 Cc. of the filtrate, and, at the same time, 100 Cc. of distilled water treated with a few drops of soda; pour into this latter solution the solution of chromate of potassium until the tint is the same as that of the former. The same operation being carried out on a titrated solution of sulphate of potassium containing 1 Gm. of $SO_3$ per liter, the value of $SO_3$ of the water in question is easily calculated. The possible error is from 1 to 2 Mgms. per liter, and the figures thus obtained with mineral waters agree with the results obtained by the gravimetric method.—Chem. News, Nov. 14, 1902, 245; from Zeit. Anal. Chim., *40*, 465.

*Artificial Mineral Water—Formulæ.*—The following formulæ are recommended in "Merck's Report" (May, 1903, 143), as affording suitable artificial mineral waters for charging in fountains:

VICHY.

| | |
|---|---|
| Sodium carbonate | 4250 grains. |
| Sodium chloride | 110 grains. |
| Potassium chloride | 140 grains. |
| Sodium bromide | 10 grains. |
| Lithium carbonate | 10 grains. |
| Calcium chloride | 725 grains. |
| Magnesium chloride | 300 grains. |
| Water | 10 gallons. |

HUNYADI.

| | |
|---|---|
| Magnesium sulphate | 41,200 grains. |
| Sodium sulphate | 41,600 grains. |
| Potassium sulphate | 220 grains. |
| Sodium chloride | 3,135 grains. |
| Sodium bicarbonate | 1,250 grains. |
| Water | 10 gallons. |

LITHIA.

| | |
|---|---|
| Lithium carbonate | 120 grains. |
| Sodium bicarbonate | 1,100 grains. |
| Carbonated water | 10 gallons. |

HIGH ROCK.

| | |
|---|---|
| Sodium bicarbonate | 4,480 grains. |
| Potassium sulphate | 15 grains. |
| Sodium chloride | 2,270 grains. |
| Potassium chloride | 85 grains. |
| Sodium bromide | 10 grains. |
| Calcium chloride | 1,020 grains. |
| Magnesium chloride | 50 grains. |
| Iron chloride | 15 grains. |
| Water | 10 gallons. |

*Bitter Waters—Formulæ.*—"Merck's Report" (Dec., 1902, 482) gives the following formulæ for "bitter waters:"

| | | |
|---|---|---|
| No. 1. | Potassium sulphate | 6 grains. |
| | Calcium sulphate | 60 grains. |
| | Sodium sulphate | 3½ av. ozs. |
| | Magnesium sulphate | 4½ av. ozs. |
| | Water, to make | 1 gallon. |
| No. 2. | Potassium sulphate | 2 grammes. |
| | Sodium chloride | 54 grammes. |
| | Sodium bicarbonate | 198 grammes. |
| | Sodium sulphate, dry | 684 grammes. |
| | Calcium sulphate | 57 grammes. |
| | Magnesium sulphate, dry | 93 grammes. |
| | Iron sulphate | 1 gramme. |
| | Water | 10 gallons. |

CHARTÆ.

*Litmus-Paper—Improved Sort.*—An improved sort of litmus-paper is prepared by Dieterich, which has red and blue stripes on the same paper, an isolating body—ceresin or paraffin—being intervened between the stripes so as to prevent the possibility of the acid litmus affecting the blue alkaline. The advantages of such a paper are that the tests for alkalinity or acidity are made simultaneously. It is thought that this idea can be so elaborated that three or more test-papers could be combined for the simultaneous testing for a number of substances. As may be supposed, the production of such papers is possible only by the use of a specially designed apparatus.—Pharm. Centralh., 1902, 416.

CAPSULÆ.

*Capsule Filler and Powder Divider—A New Home-Made Form.*—Edward P. Higly describes a capsule filler of his own device, which can be applied to the division of powders under certain modifications. Both forms are fully described and shown in illustrations, but the description cannot be profitably condensed and the original paper must therefore be consulted in Merck's Rep., Feb., 1902, 36–37.

*Soluble Elastic Capsules—Method of Making.*—Cuvier R. Marshall describes the method of making soluble elastic capsules. The jelly-like composition is first melted on a water-bath kept at a temperature of about 40° C. by means of a coil of steam-pipe. Then highly polished brass molds, fixed in a wooden bar, are dipped for a few moments into the liquid, a film of which adheres to the surface molds. The molds are lifted from the solution with care to avoid the collection of an excess of fluid and the formation of bubbles, and the bar is placed at the upper end of the groove formed by the periphery of the wheels and the frame of the apparatus in front of the operator. It should be added that the ends of the bar are rounded and fit the groove closely. As the wheels revolve toward the operator the descending bar traverses the groove, turning the molds over and over and giving the gelatin film the opportunity to "set" evenly on the surface of the molds. The bar passes backward from the lower end of the groove, onto a horizontal track, from which it is taken by a young woman who, with nimble fingers, dexterously pulls or strips the capsules from the molds without injury or loss of time. The necks of the capsules are then trimmed, when they are ready for filling. When filled they are sealed with a drop of the melted composition from which the capsules are made.—Bull. Pharm., May, 1903, 199.

CARBASUS.

*Corrosive Sublimate Gauze—Estimation of Mercuric Chloride.*—G. Frerichs communicates a modification of Denner's method for the determination of mercuric chloride in surgical dressings, which is applicable to

the fabric direct—instead of its preliminary extraction with sodium chloride solution—and thus saves much time. He places the material in a funnel and saturates it with a dilute solution of ammonium sulphide. It is then washed freely with water, then with water acidulated with hydrochloric acid (to remove the last traces of ammonium sulphide), and finally with more water. Sulphide of mercury is entirely retained in the fabric, and no loss need be feared during the washing. The fabric, which is grey to black, according to the proportion of mercury present, is then expressed, placed in a wide-mouth stoppered bottle, and treated with a known quantity of $\frac{N}{10}$ iodine solution diluted with water. After thoroughly mixing the contents of the bottle by agitating or stirring, the excess of iodine is determined by $\frac{N}{10}$ sodium thiosulphate solution, using starch mucilage as indicator. Each Cc. of iodine solution used up during the process corresponds to 0.01355 Gm. mercuric chloride. The author states that his method gives results agreeing with Denner's original process. By spreading the material out on a plate, and drenching with dilute ammonium sulphide solution one can easily determine, by the color produced, whether the antiseptic material is evenly distributed.—Apoth. Ztg., 1902, 834.

ELIXIRA.

*Elixirs—Method of Securing a Clear Preparation.*—E. P. Ferté observes that nearly all formulas for elixirs direct more volatile oil than the solvent is capable of taking up, hence there is trouble in the subsequent clarification. Taking

*Elixir of Orange*, as an example, he has tried the usual methods of clarification, but failed to obtain satisfactory results. Under the following formula and manipulation, however, a crystal-clear elixir is obtained which will hold even difficultly soluble active ingredients in solution:

| | |
|---|---|
| Deodorized alcohol | 300 Cc. |
| Distilled water | 500 Cc. |

Mix well and allow to become thoroughly cool. Place in a bottle that will allow plenty of room for shaking and add two cubic centimeters of fresh oil of orange. Shake occasionally during two or three days, and then filter through absorbent cotton placed in the neck of a funnel. Add to the filtrate about ten cubic centimeters of deodorized alcohol (to prevent precipitation, if the elixir should be exposed to very low temperatures), and in it dissolve two hundred and fifty grammes of cube sugar, preferably by percolation.

*Elixir of Ammonium Valerianate* the author finds is improved most effectively by the addition of chloroform and vanillin, according to the following formula, these additions disguising the disagreeable smell and taste of the ammonium valerianate:

| | | |
|---|---|---|
| Ammonium valerianate | 35 | Gm. |
| Water of ammonia | 20 | Cc. |
| Spirit of chloroform | 10 | Cc. |
| Vanillin | 1.5 | Gm. |
| Tincture of cudbear | 30 | Cc. |
| Elixir of orange, enough to make | 1000 | Cc. |

The use of

*Saccharin in Elixir* is sometimes recommended as a sweetener, and it is regarded by the author as being of much value in those containing a great amount of vegetable extraction. The saccharin, however, has a "tarry" taste, which is intensified by the use of sodium bicarbonate usually recommended for effecting its solution. The author finds that the *Ammoniacal Solution of Saccharin* possesses much less of the "tarry" taste than does the sodium salt, and recommends its preparation according to the following formula:

| | |
|---|---|
| Saccharin | 20 Gm. |
| Water of ammonia | 80 Cc. |

Dissolve and evaporate the excess of ammonia by warming to about 70° C., and add distilled water to make 100 cubic centimeters.—Bull. Pharm., Aug., 1902, 320.

*Calisaya Tonic—Formula.*—According to H. P. Pettigrew a very successful calisaya tonic is the following:

CALISAYA TONIC.

| | |
|---|---|
| Iron phosphate (scales) | 1024 grains. |
| Strychnine sulphate | 6 grains. |
| Quinine sulphate | 128 grains. |
| Cinchonidine sulphate | 64 grains. |
| Cinchonine sulphate | 64 grains. |
| Elixir orange | q. s. ad. 1 gallon. |

Put the alkaloids (except strychnine) in one-half gallon elixir, dissolve by agitation. (Dissolve strychnine in boiling water and add to it.) Dissolve the iron salt in a small amount of water by boiling it in a flask or capsule, using as little water as possible, and add to previous mixture. Then add enough elixir to make one gallon, color brownish-red with caramel and solution of aniline-red. Mix and filter.—West. Drug., Febr., 1903, 61.

*Aromatic Blackberry Cordial—Formula.*—H. P. Pettigrew recommends the following formula for preparing a satisfactory "carminative mixture" for the summer complaints of children: Blackberry root, 4 ozs.; Ceylon cinnamon, 2 ozs.; cloves, 1 oz.; allspice, 1 oz.; brandy, 2 pints; blackberry juice, 2 pints; sugar, 3 lbs.; alcohol, one part; water, three parts, enough to make one gallon. The root and spices are bruised, percolated

in the usual way with the mixture of alcohol and water, to make one quart of percolate, which reserve; continue the percolation to exhaustion, evaporate to a small bulk, add to the reserved portion, and then add the other ingredients. When the sugar is dissolved, strain and bottle.—West. Drug., Feb., 1903, 62.

*Blackberry Brandy—Practical Formulas.*—The following formulas for "blackberry brandy" are recommended in "Merck's Report" (July, 1902, 296):

| | | |
|---|---|---|
| No. 1. | Crushed blackberries | 4 pints. |
| | Brandy | 4 pints. |
| | Sugar | 1 lb. |

Macerate the berries in the brandy for 5 or 6 days, express the liquor, add the sugar, and after a fortnight decant or filter.

| | | |
|---|---|---|
| No. 2. | Blackberry root | 1 lb. |
| | Cloves | 1 oz. |
| | Cinnamon | 1 oz. |
| | Syrup | 8 fl. oz. |
| | Brandy | to make 1 gal. |

Exhaust the drugs by percolation or maceration with enough brandy to make 7½ pints, and add the syrup.

| | | |
|---|---|---|
| No. 3. | Blackberry ether | 1 fl. dr. |
| | Blackberry juice | 16 fl. oz. |
| | Syrup | 8 to 16 fl. oz. |
| | Deodorized alcohol | to make 1 gal. |
| | Caramel to color. | |

EMULSA.

*Emulsions—Hospital Formulas.*—The following formulas for emulsions are given in the St. Thomas Hospital Pharmacopœia (1902):

*Emulsio Chloroformi:* Chloroform, 1 fl. oz.; tincture of quillaya, 3 fl. ozs.; water, enough to make 1 pint (Imp. Meas., Rep.). Mix, with strong agitation. This preparation has the same strength as the official (B. P.) "Spirit of Chloroform," which it may replace as a flavoring and preservative addition to "Mixtures," etc.

*Emulsio Paraffini (Aseptic Shaving Cream):* Hard paraffin (m. p., 55° C.), 22 parts; prepared suet, 3 parts; soft soap, tragacanth (in powder), glycerin, of each 2 parts; oil of lavender, 1 part; boiling water, 68 parts. Place the hard paraffin and suet in a vessel surrounded by hot water, add the soap and boiling water, and vigorously beat the mixture until a smooth white emulsion is obtained. Remove the surrounding hot water, and gradually add the tragacanth, continuing the beating and stirring until the temperature has fallen below 50° C. When nearly cold add the glycerin and oil of lavender. This product should have the con-

sistence of a soft paste, and is used to facilitate the shaving of skin-areas before surgical operations, so as to obviate the use of a shaving-brush and soap. The particles of wax form an embedding film, which supports the hairs during the passage of the razor. A thin layer should be rubbed over the area to be shaved and the razor immediately applied. Paraffin emulsion may also be used as an ointment basis. It leaves an inconspicuous film upon the surface of the skin, which does not adhere to the patient's clothing.—Pharm. Journ., Nov. 15, 1902, 500.

*Emulsions of Liquid Petrolatum—Formulas.*—In a paper on "the pharmacy of liquid petrolatum," which will give much general information, particularly in the therapeutic value of liquid petrolatum, E. Fullerton Cook communicates the following formulas for a plain emulsion of liquid petrolatum and one containing hypophosphite:

*Emulsion of Liquid Petrolatum, Plain,* is made by mixing 4 ozs. of liquid petrolatum with 2 ozs. of powdered acacia in a dry mortar, adding 4 fl. oz. of water all at once, and triturating until a perfect emulsion results; then add 32 minims of oil of wintergreen and enough water to make 1 pint.

*Emulsion of Liquid Petrolatum with Hypophosphites* is made in the same way initially, but dissolving in 6 fluid ounces of the water to be finally added, 330 grains of calcium hypophosphite and 110 grains each of potassium and sodium hypophosphite. Both formulas have proven satisfactory. The vegetable oil, supposed by some to be necessary, is not necessary or advantageous.—Amer. Journ. Pharm., June, 1903, 260–264.

*Benzosol Emulsions—Various Practical Formulas.*—Frederick E. Niece, in view of the wide range of applications to which benzosol is put, has studied the pharmacy of this substance, and as the result of his studies and experiments, submits the following formula for benzosol emulsion:

*Compound Emulsion of Petrolatum with Benzosol:*

| | |
|---|---|
| Benzosol (powdered) | 256 grains. |
| Liquid petrolatum (viscid; amber) | 4 ounces. |
| Powdered acacia | 3 ounces. |
| Glycerin | 2 ounces. |
| Oil of cloves | 3 drops. |
| Water (hot), enough to make | 1 pint. |

Add the petrolatum and acacia together in a mortar, triturate thoroughly to a homogeneous mixture; add the oil of cloves, triturate, then add the glycerin and benzosol previously mixed by trituration in a mortar. Mix all together thoroughly, then add the water in three equal proportions by constant trituration, continuing until a complete emulsion is formed. Rapidity in this instance insures good results. Each teaspoonful contains two grains benzosol and fifteen minims of petrolatum. The hypophosphites, one or all, may be added to the above, by first dissolving them in the water, prior to adding to the mixture.

*Egg Emulsion of Cod-Liver Oil with Benzosol:*

| | | |
|---|---|---|
| Benzosol (powdered) | 128 | grains. |
| Cod-liver oil | 8 | ounces. |
| Powdered acacia | 1½ | ounces. |
| Glyconin, U. S. P. | 1½ | ounces. |
| Oil of wintergreen | 15 | minims. |
| Oil of bitter almonds | 8 | minims. |
| Glycerin | 2 | ounces. |
| Hot water, enough to make | 1 | pint. |

Rub the acacia with one and a half ounces of hot water in a mortar to a smooth mucilage, when cool, add the glycerin by trituration; next add the mixed oils with the benzosol added, and add these by trituration to the above. Triturate this mixture constantly until a thick paste is formed; then add the glycerin and sufficient water to make a pint of the product. Each teaspoonful contains benzosol, 1 grain, and cod-liver oil, 30 minims. —Pharm. Era, Feb. 12, 1903, 170.

*Cod-Liver Oil Emulsion—Convenient and Rapid Preparation with Irish Moss.*—R. A. Robinson states that by the pestle-and-mortar method a cod-liver oil emulsion is not more quickly made with Irish moss than with acacia, but if equal quantities (say 6 fl. ozs.) of cod-liver oil and of a 2 per cent. decoction of the moss (the moss being boiled with the water for half an hour and then made up in its original bulk and strained) be placed together in a one-pound jam-pot or other suitable vessel, and whipped with a stirrer making 1,200 revolutions a minute, a thick, white emulsion is formed in a few seconds. This speed can very readily be attained by the use of an ordinary egg-whisk, in which are two circular-rotating beaters, attached by cranks to a handle turned by the operator. Many such egg-whisks are geared up, so that for each complete turn of the handle the beaters complete five revolutions, and no difficulty will be found in turning the handle four times in a second; the speed mentioned is thus arrived at. An emulsion, slightly sweetened, containing 25 per cent. of oil, and flavored with almonds, lemon or wintergreen oil, is a very stable and satisfactory article for sale. The addition of about 20 per cent. of glycerin or half a grain of benzoic acid per fluid ounce of emulsion will be necessary if the product is to be kept any time bottled. The method above described will not answer with mucilage of acacia.—Pharm. Journ., Jan. 24, 1903, 96.

*Cod-Liver Oil Emulsions and Preparations—Various Formulas.*—A large number of formulas for popular cod-liver oil preparations have been collected and are given in brevity in Schweizer Wochenschr. f. Chem. u. Pharm. (*40* [1902], 400), among them many that are given in the National Formulary, or are well known in this country. Omitting these, the following may prove interesting for reference:

*Gay's Cod-Liver Oil Emulsion.*—Cod-liver oil, 500; sugar, 190; gum acacia, 5; gum tragacanth, 5; infusion of coffee, 200; rum, 100. Mix the sugar and gums. Shake up the oil with the coffee. Add a portion of this liquid to the powders in a mortar and rub together until an emulsion is formed; then add the rum, and lastly, the rest of the oily mixture—emulsifying the latter by trituration.

*Durst's Emulsion of Cod-Liver Oil and Hypophosphites.*—Cod-liver oil, 250 Gm.; gum tragacanth, 1 Gm.; saccharin, 0.2 Gm.; sodium bicarbonate, 0.1 Gm.; yolk of two eggs; simple tincture of benzoin, 3.5 Gm.; chloroform, 2 Gm.; oil of bitter almonds, 10 drops; alcohol, 10 Gm.; sodium hypophosphite, 10 Gm.; calcium hypophosphite, 10 Gm.; water, sufficient to make 500 Gm. of emulsion. Dissolve the saccharin and sodium bicarbonate in about 150 Gm. of water. Rub down a little of the oil with the gum, the yolk of egg, and a little of this water, gradually add the other liquids, oil and water alternately, thoroughly emulsifying after each addition. Finally add the hypophosphites dissolved in the remainder of the water necessary to bring the whole to 500 Gm.

*Chocolate Emulsion of Cod-Liver Oil.*—Decoction of Irish moss (1 : 20), 150; cod-liver oil, 250; glycerin, 60; cacao powder, 30; essence of vanilla, 0.50. Rub the cacao powder with the decoction, warm the mixture, add the oil and glycerin and emulsify with egg yolk.

*Licorice Emulsion of Cod-Liver Oil.*—Cod-liver oil, 60; glycerin, 30; glycyrrhizin, 3.5; water to make 120. Emulsify.

*Sweetened Cod-Liver Oil.*—Cod-liver oil, 100 Gm.; saccharin, 0.4 Gm.; acetic ether, 2 Gm.; peppermint oil, 5 drops.

*Eucalyptus Emulsion of Cod-Liver Oil.*—Cod-liver oil, 240 Gm.; sodium carbonate, 0.6 Gm.; oil of eucalyptus, 0.75 Gm.; syrup, q. s. to produce 450 Gm. Emulsify.

*Duquesnel's Cod-Liver Oil.*—Cod-liver oil, 150; oil of eucalyptus, 2. Mix.

*Kreytschy's Cod-Liver Oil.*—Cod-liver oil, 500; freshly ground coffee, 20; animal charcoal, 20. Heat together to 60° C. in a flask for fifteen minutes. Allow to stand for several days, then filter.

*Dieterich's Iodized Cod-Liver Oil.*—Cod-liver oil, 100; iodine, 1; chloroform, 2. Rub down the iodine with a little of the oil. Add the chloroform, then the rest of the oil, and shake until a clear mixture results.

*Töllner's Iodized Cod-Liver Oil.*—Tincture of iodine (1 : 10), 10; cod-liver oil, 1,000. Mix.

*Reboul's Concentrated Iodized Cod-Liver Oil.*—Rub down iodine, 5, with cod-liver oil, 250; introduce into a flask, and heat on the water-bath until the iodine has combined, as shown by the non-production of a blue

color, when a little of the oily liquid is treated with starch solution. This concentrated iodized oil is used as a basis for making the prescribed solutions.

*Ferrated Cod-Liver Oil*—Solution of ferric chloride is precipitated with an excess of solution of sodium benzoate. The precipitate is collected, washed, drained, and twenty parts of this is mixed with sufficient sodium benzoate to form a dry powder. This is rubbed down with 100 parts by weight of cod-liver oil, and heated on the water-bath at a temperature not exceeding 32° C. The ferric benzoate is thus dissolved, while the sodium salt remains insoluble, and is filtered out. The oily solution, containing about 2 per cent. of iron, is diluted with 4 to 9 parts of oil for medicinal use.

*Dieterich's Ferrated Cod-Liver Oil.*—Solid dialyzed iron, 37.5 Gm., is dissolved in distilled water, 200 Cc. White, hard soap, 3.5 Gm., is also dissolved, by the aid of heat, separately in a similar quantity of water. The solutions are cooled and mixed; the precipitated ferric oleate is collected, washed and drained until the weight is 20 Gm. It is then placed in a capsule with sodium chloride, 5 Gm., and cod-liver oil, 100 Gm., and heated on a water-bath, with constant stirring, until the iron oleate is dissolved. The product is then filtered. It contains about 2 per cent. of iron, and is diluted with cod-liver oil before use.

*Iodized Cod-Liver Oil and Iron.*—(1) Iron filings, 2; iodine, 4; cod-liver oil, 40, are mixed in a mortar, a little ether being added and triturated together until a blackish mixture results. This is then made up to 1,000 Gm., with more oil, and filtered. It contains about 0.5 per cent. of ferrous iodide. (2) Iodine, 1.7; iron filings, 1; cod-liver oil, 1,000. Introduce into a flask and leave in contact for eight days, with occasional agitation. Filter and add cod-liver oil, 900. The product contains about 0.2 per cent. of ferrous iodide.

## EXTRACTA.

*Alcoholic Extracts—Yield and Alkaloidal Value when made with Alcohol of Different Strengths.*—In 1897 R. Wright recorded the results of a series of experiments made with the object of ascertaining the relative value of certain official (B. P.) extracts made from the juice of the fresh drug and of the corresponding extracts made from the dry drug by extraction with 70 per cent. alcohol. He has since supplemented the work already done by preparing a second series of extracts with menstrua of other strengths, weaker in the case of all extracts except colchicum, for which a stronger menstruum was used. The following table (rearranged by the Reporter) shows the alcoholic strength of menstruum used, the alkaloidal strength of the extracts, and the approximate yield per pound of the dried drug, and, by way of comparison, the standard given for alcoholic extracts of the same drug by C. H. La Wall in a paper read before

the Pennsylvania Pharmaceutical Association, and the standards supplied to the author by a prominent firm of manufacturers:

| Extract. | Wright, 1897. | | | Wright, 1902. | | | La Wall. | Manufacturer. |
|---|---|---|---|---|---|---|---|---|
| | Menstruum. | Yield per lb. | Alkaloid per cent. | Menstruum. | Yield per lb. | Alkaloid per cent. | Alkaloid per cent. | Alkaloid per cent. |
| | | Ozs. | | | Ozs. | | | |
| Aconite leaf..... | 70 per cent. | 2½ | 0.60 | | | | | |
| Aconite root..... | 70 " | 4 | 2.44 | 45 per cent. | 5 soft | 1.22 | 2.50 | test, physiological |
| Belladonna leaf... | 70 " | 4 | 2.86 | 45 " | 4 | 2.00 | 2.00 | 1.75 |
| Conium fruit..... | 70 " | — | 8.15 as hydrochloride | 45 " | 2¾ | 7.00 as hydrochloride | 1.75 | 2.50 |
| Colchicum root... | 50 " | 2¾ | 1.67 | 70 " | — | 2.10 | 2.00 | 2.50 |
| Colchicum seed... | 50 " | 2 | 3.16 | 70 " | 3¾ | 4.00 | none | 2.50 |
| Hyoscyamus leaf.. | 70 " | 4 | 0.30 | 50 " | 6¼ | 0.25 | 0.90 | 0.50 |
| Stramonium leaf.. | 70 " | 2 | 1.54 | —— | — | — | none | 1.50 |
| Stramonium fruit.. | 70 " | — | 2.73 | —— | — | — | 1.75 | 1.50 |

Comparing the standards of La Wall and the manufacturer with those obtained by the author, they appear, with one or two exceptions, to be reasonable and practicable. Alcoholic extracts prepared from conium and hyoscyamus grown in England evidently need different standards from those above given. Moreover, all prognostication must to a very great extent be speculative, in view of the fact that the alkaloidal strength of an alcoholic extract is determined very largely by the alcoholic strength of the menstruum employed for the extraction of the drug, and to a certain extent also by the degree of exhaustion which is effected.—Trans. Brit. Pharm. Conf., 1902, 499–501.

*Belladonna and Henbane Extracts—Variation of Alkaloid on Keeping.*—G. Ortlieb finds that the alkaloidal value of the extracts of belladonna and henbane diminishes on keeping; that by the method of the Pharm. Germ. volatile and non-volatile bases, other than mydriatic alkaloids, are determined with and calculated as the latter; and that these other bases may be naturally present in the drug, or may have been produced by the action of bacteria, or of moulds. Thus he found that an extract yielding 1.84 per cent. of alkaloids, yielded as much as 2.59 per cent. if, at a certain stage of its preparation, it was sown with spores of *Penicillium glaucum* and the growth of these allowed to continue for ten to twelve days. These results point out the desirability of further investigation and a revision of the method of determining the proportion of active alkaloid present in the preparations named.—Pharm. Ztg., 1903, 162.

EXTRACTA FLUIDA.

*Percolation as Applied to the Liquid Extracts, etc., of the B. P.—Desirability of Correcting the Method.*—Walter H. Linton, after a critical review of the history of percolation as applied to the extraction of drugs, records the results of a series of experiments undertaken with the object of ascertaining definitely whether some of the processes of the British Pharmacopœia were as effective as they might be, and what conditions would be most favorable for rapid exhaustion in each case, his attention being particularly directed to the amount of menstruum used to moisten the drug, and to the rate at which the removal of the active constituents was effected. The preparations selected as most suitable for this investigation were liquid extract of coca, liquid extract of cimicifuga, and liniment of aconite. In the case of the liquid extracts, the official directions require preliminary maceration of the powdered drug with two parts by volume of the menstruum to one part by weight of the drug; in that of the liniment equal volumes and weight parts respectively. The conclusions reached by the author's experiments are summarized by him as follows: It has been shown "that when liquid extract of coca is prepared by the pharmacopœial method the major portion of the alkaloid is contained in the weak percolates, and is consequently subjected to a fairly high temperature for some considerable time during concentration. That this is prejudicial to the resulting preparation is evident. By reducing the amount of menstruum used in moistening the drug this unsatisfactory condition of things may be reversed, and considerably more than half the alkaloid may be obtained in the reserve. The best results are obtained when the drug is moistened with the menstruum in the proportion of half a fluid part for each part by weight of drug. Another point worthy of consideration is that the drug is in a much better condition for packing when moistened with the smaller amount than when it is treated in the way directed by the Pharmacopœia."

"In the case of cimicifuga similar results have been obtained. Here again the B. P. method appears to be faulty, in that practically two-thirds the total soluble matter is extracted in the weak percolates. The process is also very messy, and altogether unsatisfactory. Even supposing that the effect of concentration is not so serious as in the case of coca, the condition of the drug before packing is sufficient to make an alteration desirable. The best results were obtained by moistening one part by weight of drug with half a fluid part of the alcohol, when practically two-thirds of the total solid is extracted in the reserve. This modification also effects a saving in the amount of alcohol used, as practical exhaustion of the drugs (coca and cimicifuga) is attained much sooner than when carrying out the B. P. process. The results from the experiments on liniment of aconite fully bear out the conclusions arrived at in the two previous cases. With this preparation there is no concentration of weak percolates to be

considered, but it has been shown that the drug may be effectively exhausted with a much smaller amount of alcohol than is at present ordered if the drug be moistened in the proportion of half a fluid part for one part by weight of drug, and the resultant powder is in a workable condition, instead of being in a semi-fluid mass, such as is obtained when treated in the manner described by the Pharmacopœia. In addition to this obvious advantage a stronger liniment may be prepared by collecting one fluid part for each part by weight of drug, if that should be thought desirable."—Pharm. Jour., Mar. 14, 21 and 28, 1903, 389, 420 and 457.

*Standardized Fluid Extracts and Tinctures, B. P.—Alkaloidal Stability.*—In view of the statements made from time to time that the variation in alkaloidal content of standardized preparations is due to the length of time they have been kept in stock, W. A. H. Naylor and C. Huxtable have subjected the preparations below mentioned to examination from month to month, beginning with November, 1901, and ending with July, 1902. The results are shown in a table, from which the loss on the total amount of alkaloid originally present was calculated, the figures obtained being shown as follows:

| | Per cent. |
|---|---|
| Liquid extract of cinchona | 1.96 |
| Tincture of cinchona | 1.94 |
| Compound tincture of cinchona | 1.96 |
| Liquid extract of ipecacuanha | 5.66 |
| Liquid extract of nux vomica | 1.33 |

These results show that, while with keeping a depreciation of alkaloidal value of these galenical preparations occurs, the loss is very small—the extreme limit of loss being in the case of liquid extract of ipecacuanha, which amounts to 5.66 per cent. of the quantity, initially present. Furthermore, the indications are distinctly in favor of the loss of alkaloid by precipitation as opposed to loss of alkaloid by decomposition.—Trans. Brit. Pharm. Conf., 1902, 377–379.

*Fluid Extracts—Preparation from Green Drugs.*—Chamberlain insists on the importance of securing the true active principle of vegetable drugs in fluid extracts. Some drugs suffer no deterioration if properly dried, and under proper conditions may be kept indefinitely. Others, while not injured in the drying process, are so subject to the attacks of insects and worms, that they soon become filthy and unfit for medicinal use. In others again, certain volatile constituents on which the therapeutic value of the drug depends, are lost by decomposition and evaporation in the dried form, some instances of which he mentions; for example, the fluid extract of viburnum prepared from the dried plant as compared with the one from the fresh green bark, both in its physical characteristics and in its therapeutic properties. In some cases where the active principles are

resinous in their nature, although in solution in the natural juices of the plant, and at that time freely soluble in alcohol, they become hard and insoluble in even the most powerful solutions after the drug has been dried, as in the case of stillingia. He quotes from others in support of these views. The medicinal properties of plants are, to a considerable extent, complex and unstable organic bodies. In making the extracts, therefore, he says we should be careful to have them made from substances in which all the virtues are still retained.—Drug. Circ., Jan., 1903, 20; from Lancet-Clinic.

*Acetic Fluid Extracts—Strength of Menstruum, Stability, Etc.*—In 1899 Prof. F. J. Wulling reported on a series of experiments made with a view towards ascertaining the value of acetic acid as a menstruum in the exhaustion of organic drugs, and arrived at conclusions which emphasized that according to the drug to be extracted, different strengths of acid were necessary, but that a six per cent. acid gave satisfactory results in some cases. He now reports on results obtained since then which lead him to the conclusion that a ten per cent. acid is more satisfactory in most cases than a six per cent., and that fluid extracts that can be made at all with acetic acid as a menstruum, are apparently as permanent as those made with alcohol, as will become evident on examining the following table showing the changes in acetic fluid extracts made in 1899:

| Drug. | Liquid Portion Per cent. | Deposit Per cent. | Condition. |
|---|---|---|---|
| Tobacco | 94 | 6 | Clear. Coating on sides. |
| Veratrum viride | 98 | 2 | Clear. Coating on sides. |
| Belladonna leaf | 98 | 2 | Clear. |
| Hyoscyamus | 98 | 2 | Clear. |
| Cotton root bark | 97 | 3 | Precipitate gelatinous. |
| Belladonna root | 97 | 3 | Clear. Coating on sides. |
| Aconite root | 98 | 2 | Clear. |
| Malt | 98 | 2 | Heavy coating on sides. |
| Valerian | 97 | 3 | Clear. |
| Burdock | 99 | 1 | Slight cloudiness. Coating on sides. |
| Hydrastis | 98½ | 1½ | Clear. |
| Sarsaparilla compound | 95 | 5 | Clear. Heavy coating on sides. |
| Spigelia | 99 | 1 | Clear. Coating on sides. |
| Krameria | 96 | 4 | Clear. |
| Cascara, aromatic | 96 | 4 | Considerably gelatinized. |
| Buckthorn | 99 | 1 | Clear. Coating on sides. |
| Cypripedium | 99 | 1 | Clear. |
| Gentian compound | 99 | 1 | Clear. |
| Ipecac | 67 | 33 | Cloudy. |
| Digitalis | 87 | 13 | Clear. |
| Gentian | 99 | 1 | Clear. |
| Senega | 50 | 50 | Nearly gelatinized. |
| Hydrangea | 99 | 1 | Clear. |
| Canvallaria | 99 | 1 | Clear. |
| Stillingia | 99 | 1 | Clear. |
| Eucalyptus | 98 | 2 | Clear. |
| Pilocarpus | 98 | 2 | Cloudy. |
| Sarsaparilla | 99 | 1 | Clear. Deposit gelatinized. |
| Colchicum seed | 99½ | ½ | Clear. Coating on sides. |
| Yellow dock | 97 | 3 | Clear. Coating on sides. |
| Prickly ash | 98 | 2 | Clear. Coating on sides. |
| Senna | 98 | 2 | Clear. Coating on sides. |
| Lobelia | 99 | 1 | Clear. |
| Dandelion | 99 | 1 | Clear. Coating on sides. |
| Colombo | 98 | 2 | Clear. |
| Squills | 100 | 0 | Clear. Trace of deposit. |
| Buchu | 99½ | ½ | Clear. |
| Sanguinaria | 97 | 3 | Clear. Coating on sides. |
| Skullcap | 98 | 2 | Clear. Coating on sides. |
| Cascara | 99 | 1 | Clear. Coating on sides. |
| Cimicifuga | 99 | 1 | Clear. Coating on sides. |
| Ergot | 90 | 10 | Clear. Coating on sides. |
| Quassia | 99 | 1 | Clear. |
| Compound red cinchona | — | — | Very thick, dark, syrupy. |
| Leptandra | 94 | 6 | Clear. Coating on sides. |
| Rhubarb | 97 | 3 | Clear. |
| Ginger | 98 | 2 | Clear. Coating on sides. |
| Conium | 97 | 3 | Cloudy. |
| Coca | 97 | 3 | Clear. Coating on sides. |
| Wild cherry | 99 | 1 | Slightly cloudy. |
| Nux vomica | 99½ | ½ | Clear. |
| Gelsemium | 99 | 1 | Clear. |
| Larkspur | 99 | 1 | Clear. Slight coating. |
| Capsicum | 98 | 2 | Clear. |
| Red cinchona | 95 | 5 | Clear. |
| Arnica root | 97 | 3 | Slightly cloudy. |
| Buchu | 99½ | ½ | Slightly cloudy. |

The author firmly believes that it will not be very long before preparations made with acetic acid as a menstruum will have become established in our Materia Medica.—Proc. Minn. State Pharm. Assoc., 1902, 103–106.

*Liquid Extract of Cascara Sagrada, B. P.—Improved Manipulation.*—J. P. Gilmour observes that the B. P. process for liquid extract of cascara may be improved by prolonging the preliminary maceration. If the bark be moistened with the B. P. proportion of water and allowed to macerate for twelve hours the marc is exhausted with from three-fourths to four-fifths the menstruum otherwise required. Maceration for longer periods, such as eighteen and twenty-four hours, effects no further saving, and is indeed a disadvantage, since the bark swells much more and percolation is additionally difficult.—Pharm. Journ., Jan. 24, 1903, 94.

*Extractum Filicis Liquidum, B. P.—Emulsification.*—In lieu of mucilage of acacia, commonly employed for emulsifying extractum filicis liquidum, B. P., Henry Carter recommends tincture of senega, manipulating as follows: For every drachm of extract use 10 minims of tincture of senega, the *modus operandi* being to measure the tincture, add water up to a volume equal to that of the extract, then pour the latter into the mixture of tincture and water. Next transfer to a bottle and shake well; then make up with water, or other menstruum, to the required quantity.—Pharm. Journ., Oct. 11, 1902, 369.

*Liquid Extract of Nux Vomica, B. P.—Strychnine in Separated Fat.*—W. Carter White and J. G. C. Locker preparing liquid extract of nux vomica according to the official B. P. directions, in which 90 per cent. alcohol is used, obtained an extract freed from fat, which yielded from 10 lbs. of the drug 109.33 ozs. of liquid extract of the official strength. The separated fat, weighing 2.4 ozs., was however found to contain 4.3 per cent. of strychnine. In a second experiment, using 10 lbs. of the same drug, 79 per cent. alcohol containing 1 per cent. of hydrochloric acid, the amount of fat was reduced to 0.9 oz. The de-fatting process was carried out as in the previous method, using alkali and acid in the required proportions, when a fat-free extract containing 4.401 per cent. of strychnine was obtained, which produced 117.36 ozs. of liquid extract. The 0.9 oz. of fatty matter yielded 2.4 ozs. of liquid extract, therefore the total product was 119.76 ozs., an increase of 5 per cent. upon the official process.—Chem. & Drug., July 19, 1902, 87.

*Extractum Nucis Vomicæ Liquidum, B. P.—Modification of Shaking-Out Process.*—F. H. Alcock calls attention to the difficulty experienced by him and his assistants in carrying out the official directions for assaying liquid extract of nux vomica, the difficulty consisting in the separation of the chloroformic solution during the shaking-out step of the process. These directions are as follows: "Evaporate 10 Cc. to a thick syrupy consistence on a water-bath; dissolve the residue in 20 Cc. of water, heat-

ing if necessary; place the solution in a separator, and add 5 Gm. of sodium carbonate, dissolved in 25 Cc. of water, together with 10 Cc. of chloroform; agitate thoroughly; set aside; separate the clear chloroformic solution." The modification suggested is as follows: Evaporate 10 Cc. as directed (or better until all the alcohol has been expelled, then add enough water to measure 10 Cc.). Dissolve or rather diffuse through 10 Cc. of warm water, transfer to a separator, add 2.5 Gm. of anhydrous sodium carbonate, and then the chloroform; agitate until the solid has disappeared and set aside. There floated on the surface of the chloroform an insoluble substance, which, however, stayed in the contraction of the separator above the stop-cock and enabled the chloroformic solution to be removed quite clear in each of the three separations. The process as further directed may then be proceeded with.—Pharm. Journ., Aug. 2, 1902, 87.

*Compound Fluid Extract of Sarsaparilla—Origin.*—In the course of an account of the historical date connected with the introduction and use of sarsaparilla preparation, which came into popular reports in the latter part of the eighteenth century, through such preparations as "Lisbon Diet Drink," or "*Decoctum Lusisarnacum*," and "Zittmann's Decoction," Dr. John Uri Lloyd touches upon the origin of the compound fluid extract of sarsaparilla. He states that in 1831, George W. Carpenter, a Philadelphia pharmacist, conceived the idea of making a fluid extract of sarsaparilla to take the place of the weak commercial syrups and decoctions then supplied and in use, and as far as he knows, with the exploitation of this and other preparations during the year mentioned, the name, "compound fluid extract" first got into print. The author reproduces a portion of Mr. Carpenter's "Essays on some of the most important articles of the Materia Medica," etc., in which much attention is devoted to sarsaparilla and its compounds, which must be consulted in the original paper in Pharm. Rev., Jan., 1903, 25–27.

## GLYCERITA.

*Glycerites — Hospital Formulas.*—The following formulas for useful "glycerites" are given in the Pharmacopœia (ed. 1902) of St. Thomas' Hospital (London):

*Glycerinum Atropinæ:* Atropine sulphate, 25½ grains; water, 5 fluid ounces. Dissolve and add compound tincture of lavender, 100 minims; glycerin, to 1 pint (Imp. Meas.). This preparation does not stain the skin or clothes of the patient. It contains 0.25 parts of atropine per 100 fluid parts, and has nearly the same strength as the glycerin of belladonna, formerly in use.

*Glycerinum Bismuthi Carbonatis:*

| | | |
|---|---|---|
| Bismuth oxynitrate | 2820 | grains. |
| Water | 3 | fl. oz. |
| Nitric acid | 4½ | fl. ox. |

Dissolve the bismuth oxynitrate in the mixture of water and nitric acid, and pour this solution into a solution of

| | |
|---|---|
| Ammonium carbonate | 5½ oz. |
| In water | 30 fl. oz. |

Allow the precipitate to subside, wash twice by decantation, collect on a fine muslin filter, drain, and mix the residue with

| | |
|---|---|
| Glycerin, a sufficiency to make the product measure | 10 fl. oz. |

This preparation contains 1 grain bismuth oxycarbonate in 2 minims. It may be prescribed with water or other aqueous vehicle and, on account of the fine state of division of the bismuth carbonate, requires no suspending agent.—Pharm. Journ., Nov. 15, 1902, 501.

*Glycerinum Bismuthi Carbonatis — A Useful Formula.*—Edmund White discusses the subject of Bismuth Salts in Mixtures. In his experience simple tragacanth is preferable to mucilage of acacia for the suspension of bismuth subnitrate or subcarbonate in aqueous media, but no suspending agent is necessary if bismuth salts be given with compound infusion of orange-peel, which he regards as an ideal vehicle for such salts on account of the absence of fermentable gum, that being an especial advantage in cases of gastric disturbance, for which bismuth salts are usually given. He also points out that, if the value of bismuth salts depends upon the formation of a sedative coating on the gastric mucous membrane, the use of freshly precipitated oxycarbonate should be preferable to that of the micro-crystalline oxynitrate. He has therefore devised a formula for Glycerinum Bismuthi Carbonatis, which is prepared as follows: Dissolve 60 Gm. of bismuth oxynitrate in 40 Cc. of nitric acid and 25 Cc. of water, and pour this solution into a solution of 55 Gm. of ammonium carbonate in 300 Cc. of water. Collect the precipitate on a calico filter, wash well, drain, and rub the moist precipitate with a sufficient quantity of glycerin to make 100 Cc. The product will contain 1 Gm. of bismuth oxycarbonate in 2 Cc., or about 15 grains in 30 minims. The suspended bismuth salt is easily and evenly diffused in the glycerin by agitation. It may be prescribed in mixtures for internal exhibition without the addition of gum, and also forms an ideal cosmetic by itself for suitable conditions of the skin.—Trans. Brit. Pharm. Conf., 1902, 472–474.

*Glycerinum Acidi Borici, B. P.—Practical Manipulation.*—J. P. Gilmour observes that the manipulation directed in the B. P. for glycerinum acidi borici is onerous, and the product often unsatisfactory. He has overcome the difficulty by concentrating the liquid resulting from the solution of the boric acid in glycerin by boiling instead of attempting simply to evaporate it to the required weight. The temperature of the liquid at the point when the boric acid has just dissolved in it varies a little, the mean temperature being 115° C. With regard to the

*Glycerinum Boracis* and *Glycerinum Acidi Tannici, B. P.*, the author says there is no need for continuous trituration of the respective drugs with the glycerin. It suffices to rub the drug down to a smooth paste with a portion of the glycerin, transfer it to a bottle, rinsing the mortar with the remainder of the glycerin, and then shaking occasionally during a day or so.—Pharm. Journ., Jan. 24, 1903, 95.

*Glycerinated Calendula—Formula.*—Calling attention to the remedial value of *Calendula* (which see under "Materia Medica"), T. A. Moseley gives the following formula for preparing a glycerinated preparation which was found useful as an application in place of other preparations of marigold flowers: Fluid extract of calendula, ℥iv; diluted alcohol, ℥j; glycerin, ℥iij; M.—Proc. Mo. Pharm. Assoc., 1902, 61.

*Formalin Glycerin—A Useful Preparation in Sycosis.*—Dr. Jordan employs a 4 per cent. solution of formalin in glycerin as an application for sycosis. The parts are first washed with a mixture of turpentine and ether, then with soap and warm water, and finally well rubbed with the glycerin solution of formalin applied by means of a linen rag until the skin becomes markedly reddened. The affected area is then covered with a dressing soaked in the solution. After leaving this *in situ* for several hours it is removed, and the parts dressed with a soothing ointment. One application is usually sufficient.—Oest. Zeits. für Pharm., 39, 880.

## LINIMENTA.

*Liniments—Competitive Formulas.*—The Tennessee State Druggists Association having offered prizes for certain pharmaceutical preparations, the following formulas were offered in competition for the best liniment:

1. *Family Liniment.*—A. B. Rains proposes: Spirit camphor, 1 oz.; tr. opium, 1 oz.; chloroform, 4 dr.; spir. ammonia, 4 dr.; spir. peppermint, 4 dr.; tinct. capsicum, 4 dr.; oil sassafras, 4 dr.; alcohol, q. s. 32 oz.

2. *Linimentum Volatis.*—B. B. Kerr proposes: Ether sulph., 72 oz.; carbon bisulph., 36 oz.; alcohol, 8 oz.; oil peppermint, 4 oz.

3. *Liniment.*—J. Goldbaum proposes: Turpentine, 8 lbs.; coal oil, 16 oz.; oil origanum, oil cedar, oil amber, oil sassafras, of each ½ lb.—Proc. Tenn. State Drug. Assoc., 1902, 50, 52 and 54.

*Liniment—Efficient Formula.*—A. E. Hiss recommends the following formula for an efficient liniment that is used with advantage in cases of bruises, sprains, rheumatism, etc.:

| | |
|---|---|
| Camphor | 4 oz. |
| Oil origanum | 4 fl. oz. |
| Oil sassafras | 4 fl. oz. |
| Tincture opium | 4 fl. oz. |
| Tincture capsicum | 12 fl. dr. |
| Alcohol | to make 4 pints. |

Dissolve the camphor in the oils and a portion of the alcohol, then add the tinctures and the remainder of the alcohol.—Merck's Rep., April, 1903, 98.

*Linimentum Atropini—Hospital Formula.*—The following formula is given in the St. Thomas Hospital Pharmacopœia (Ed. 1902):

| | |
|---|---|
| Atropine sulphate | 38¼ grains. |
| Compound tincture of lavender | 100 minims. |
| Alcohol (90 per cent.) to | 1 pint (Imp. meas.). |

This liniment does not stain the skin or clothes of the patient, and has the same alkaloidal strength (0.375 w/v per cent.) as the official belladonna liniment.—Pharm. Journ., Nov. 15, 1902, 500.

*Liniment of Camphor, B. P.—Precautions to Secure a Preparation of Full Strength.*—R. Wright observes that the number of prosecutions for the the sale of camphorated oil deficient in camphor goes to show that many chemists do not find it an easy matter to obey the official injunction to "dissolve the camphor in the oil." It should not be forgotten that the linimentum camphoræ of the British Pharmacopœia is a saturated solution of camphor in olive oil, and that in the cold, solution takes place so slowly that, unless the camphor be in an extremely fine state of division, the process may take two or three weeks to complete. The following method has in the author's hands been found the most satisfactory with the least trouble:

Take of:

| | |
|---|---|
| Camphor in flowers | 4 ounces. |
| Olive oil | 16 fl. ounces. |

Place the camphor in a dry bottle, add the oil, previously heated to 71° C. (160° F.), shake frequently till solution is effected. Working in this way, the camphor dissolves quickly and the process is completed in from one to two hours.—Trans. Brit. Pharm. Conf., 1902, 497–498.

*Linimentum Camphoræ, B. P.—Practical Manipulation.*—J. P. Gilmour observes that Wright's suggestion for dividing the camphor in the oil is a good one, but modifies the manipulation as follows: Heat three-fourths of the oil to 100° C. Place the camphor in a mortar, and triturate into fine parts with a portion of the cold oil, thin with the rest, and transfer to a warm bottle. Wash out the mortar with a little of the hot oil, and then pour this and the rest of the hot oil into the bottle and shake. The camphor will dissolve in one or two minutes.—Pharm. Journ., Jan. 24, 1903, 95.

*Camphorated Oil, B. P.—Differential Method of Assay.*—Arthur W. Mann gives the details of a method for determining the amount of camphor in camphorated oil, which has the advantage of simplicity and celer-

ity, coupled with practical accuracy. Two pairs of small paper filters are carefully balanced on the scales, the one pair against the other. Then on the top sheet of one of the pairs 0.4 to 0.5 Gm. of the camphorated oil is carefully weighed and spread and the filter laid on its companion paper; the same thing is done with the second pair of filters, using an identical quantity of olive oil. The two sets of filters are then exposed to the temperature of a hot air bath for about 20 minutes, this time sufficing for the complete vaporization of the camphor. On placing the filters on the scale pans, the weight required to restore the counterpoise indicates the amount of camphor in the sample.—Pharm. Journ., Aug. 9, 1902, 106.

*Camphorated Oil—Optical Determination of Camphor.*—It is stated that a 1 per cent. solution of camphor in olive oil gives a solution of + 1° in a 200-Mm. tube when observed with a Schmidt and Haensch polarimeter, and that this method of observation may be utilized for the determination of the proportion of camphor in camphor liniment prepared with olive oil, the optical activity of the latter being so small as to be negligible. The method can, however, not be employed if the camphorated oil is prepared with other oils, such as rape-seed, benne, or mineral oils, which possess considerable optical activity.—Pharm. Centralh., 1902, 610.

*Compound Marigold Liniment—An Efficient Preparation.*—T. A. Mosely finds a liniment prepared by mixing equal parts of tincture of calendula and distilled extract of witch-hazel to be more efficient than either of the two by themselves, and highly recommends it as an application to cuts, bruises and wounds of every description.—Proc. Mo. Pharm. Assoc., 1902, 61.

## LIQUORES.

*Liquor Arsenii et Hydrargyri Iodidi, B. P.—Composition.*—William Duncan has investigated the composition of Donovan's solution as obtained by the B. P. process, and finds that it does not contain the two iodides as such, nor as a double iodide, but that it is really a solution of arsenious oxide, with a little undecomposed iodide, mercuric iodide, and hydriodic acid, the most of the acid being combined with the mercuric iodide, forming the soluble mercuro-iodic acid, $H_2HgI_4$. Speaking of the tendency of this solution to liberate iodine, the author observes that this can be checked by adding sufficient alkali to neutralize the free hydriodic acid, and if the demand for the preparation be such as entitles it to official recognition, it would be advisable that this be done in the next Pharmacopœia. Seeing it can be readily made in a few minutes at the dispensing counter, it is better not to keep it in stock. As, however, an aqueous solution of arsenious oxide, mercuric iodide, and potassium iodide is not only more stable, but probably possesses all the medicinal virtue of Donovan's solution, there seems little reason for its retention.—Pharm. Journ., April 25, 1903, 586.

*Liquor Bismuthi et Ammonii Citratis*, according to W. Duncan, is a solution of ammonium bismuthyl-citrate, which is a compound fairly soluble in water, but precipitated from its aqueous solutions by alcohol. In accordance with their observations, the author suggests the following formula and manipulation, which has proven uniformly successful:

| | |
|---|---|
| Bismuth subnitrate | 639 grains. |
| Citric acid | 572 grains. |
| Solution of ammonia | A sufficiency. |
| Distilled water to make | 20 fl. ounces. |

Mix the bismuth subnitrate and citric acid in a mortar with 1½ fluid ounces of water; set aside for two hours, occasionally stirring, or until a little of the mixture yields a clear solution with ammonia; then add sufficient solution of ammonia to dissolve, dilute with water to 20 fluid ounces and filter. This gives a liquor containing ammonium bismuthyl-citrate equivalent to 3 grains of bismuth oxide, $Bi_2O_3$, or 5 grains of bismuth citrate, $BiC_6H_5O_7$, and 1 grain ammonium citrate in each fluid drachm. If the latter be objected to, less citric acid can be used, but he prefers liquor bismuthi to contain both ammonium citrate and alcohol for keeping purposes. If alcohol be not used, recently boiled distilled water is essential. —Trans. Brit. Pharm. Conf., 1902, 476–482.

*Liquor Bromo-Chloral Compositus—Improved Formula.*—R. Wright suggests an improved formula for liquor bromo-chloral compositus, based upon the following suggestions:

1. Increase the amount of chloral and bromide to 15 grains each in each fluid drachm, and substitute sodium for potassium bromide.

2. Omit the filtration, which takes out the resins of the Indian hemp. Add a little mucilage to suspend the resins and retain them.

3. Delete the henbane juice, and substitute hyoscine hydrobromide in the proportion of $\frac{1}{400}$th grain in each fluid drachm.

4. Increase the quantity of liquid extract of liquorice to mask the taste of the chloral and bromide, and minimise the acridity. The latter is due to the Indian hemp, and cannot altogether be overcome.

The following form is drawn on the above lines:

Take of

| | |
|---|---|
| Chloral hydrate | 2,400 grains. |
| Sodium bromide | 2,400 grains. |
| Tincture of Indian hemp | 440 minims. |
| Hyoscine hydrobromide (= solution 1 per 1,000, 440 minims) | ⅖ grain. |
| Syrup of orange | 4 fl. ounces. |
| Mucilage acacia | 1 fl. ounce. |
| Liquid extract of liquorice | 2 fl. ounces. |

Distilled water sufficient to make one pint.

Place the chloral hydrate and sodium bromide in a mortar, add 6½

ounces distilled water, the syrup of orange, and solution of hyoscine hydrobromide; triturate till solution is complete; add the mucilage of acacia, and gradually the tincture of Indian hemp. Then add the liquid extract of liquorice, and adjust the volume to one pint by means of distilled water. If necessary, strain through tow.

Each fluid drachm contains 15 grains each of chloral hydrate and sodium bromide, $\frac{1}{8}$ grain extract of Indian hemp, and $\frac{1}{400}$ grain hyoscine hydrobromide.—Trans. Brit. Pharm. Conf., 1902, 495, 496.

*Solution of Cocaine—Convenient Percentage Table for this Preparation.*—Having had occasion to fill a large number of orders for cocaine solutions, John Vincent Singer has by calculation and experiment constructed the following table, giving the exact amounts of cocaine hydrochlorate and distilled water to make 1 fluid ounce of the solution:

| Strength desired. | Amount of cocaine hydrochl. | Amount of dist. water. |
|---|---|---|
| 5 per cent. | 23 grains. | 460 minims. |
| 10 " | 46.5 " | 440 " |
| 15 " | 70.5 " | 421 " |
| 20 " | 95 " | 400 " |

—Bull. Pharm., March, 1803, 101.

In connection with the above the following definition of *Percentage Solutions*, by Dr. Geo. F. Payne, may well be considered when making the solutions in question. Dr. Payne says: "Percentage solutions are by weight unless specified by volume. Percentage by volume is not used except when the substances are liquids and can thus be easily measured. As the volume of liquids varies with the temperature, such mixtures are not accurate unless due attention is paid to the temperature; in some cases changes of volume occur from the contraction or expansion which takes place when the liquids are mixed. Percentage by weight is far simpler and more accurate than percentage by volume."—Amer. Drug., Feb. 23, 1903, 103.

*Liquor Cresoli Saponatus—An Efficient Substitute.*—Speaking of preparations of crude carbolic acid, M. I. Wilbert calls attention to a preparation in use at the German Hospital in Philadelphia in place of liquor cresoli saponatus, which, while equally efficient, has the advantage of being comparatively cheap. For making this preparation an alcoholic solution of soda soap is required, for which the author gives the following formula:

| | |
|---|---|
| Cotton-seed oil | 300 |
| Caustic soda | 45 |
| Water | 350 |
| Alcohol | 250 |

Mix.

A mixture of equal parts of this soap solution and of crude carbolic acid will give a clear reddish-brown liquid, slightly alkaline in reaction, and having about the same consistency as syrup. It mixes readily in all proportions with distilled water, yielding a solution that is yellowish-brown in color and slightly alkaline in reaction, which imparts to the hands a slippery, saponaceous feeling, but is not caustic, even in strong solution.—Amer. Drug., Nov. 10, 1902, 298.

*Liquor Ferri Acetatis, B. P.—Use of Glycerin as Preservative.*—W. Lyon observes that the present formula for solution of acetate of iron, B. P., has the disadvantage when compared to that of the B. P., 1885, that, whereas the latter could be made in a few minutes by diluting the strong solution—which keeps well—it is now made direct from solution of persulphate of iron, which takes considerable time to prepare. Some months ago he prepared four samples of the liquor, in three of which 10 per cent. of the water was displaced by alcohol, syrup and glycerin respectively. The sample containing the alcohol was the first to deposit, the ethyl acetate formed removed some of the acid, without any counterbalancing preservative effect. The official liquor was the next to show a deposit, but it was some considerable time after the alcoholic sample. The syrup and glycerin samples are still without deposit. It would therefore seem that the addition of 10 per cent., or more, of glycerin to the official liquor would be of considerable advantage, and no reasonable objection could be made to such an addition.—Pharm. Journ., Nov. 1, 1902, 437.

*Solution of Ferrous Iodide—Preparation.*—Frederic E. Niece proposes a solution of ferrous iodide as a stock preparation from which the syrup of ferrous iodide is readily made by mixing 3 parts (by volume) with 13 parts (by volume) of syrup. The formula gives entire satisfaction if carefully carried out, to which end the author gives explicit directions. Glycerin and diluted hypophosphorous acid are recommended as valuable additions for preserving the solution for an indefinite length of time. The iron wire must be carefully cleaned from dust and grease by washing with a 2 per cent. aqueous solution of hydrochloric acid, then with distilled water, and rapidly drying, weighing out the desired quantity and introducing it into a clean, dry pint flask, together with 2 fl. ozs. of distilled water. The proportions of ingredients are as follows:

| | |
|---|---|
| Iron (clean, dry, bright card teeth) ..... | 5½ dr. Troy. |
| Iodine (resublimed and dry)..... | 2 oz. and 160 grs. Troy. |
| Hypophosphorous Acid (10 per cent.) ..... | 1 fl. dr. |
| Glycerin (previously warmed, S. G. 1:25)..... | 1 fl. dr. |
| Water (distilled and ammonia-free) to make ... | 4 fl. oz. |

The iodine is added in portions, one-fourth at a time, under specific directions, which must be consulted in the original paper. After all has been thus added, the flask is heated and the contents boiled for two or

three minutes—the liquid having previously assumed a greenish hue; it is then filtered, using a long-stemmed funnel, well-covered, and extending into the mixture of glycerin and hypophosphorous acid—the measure being brought to four fluid ounces with the distilled water rinsings of the flask, &c., passed through the same filter. The finished solution is preserved in one-ounce bottles of brown glass, completely filled, with the ground-glass stopper well paraffined, and stored in a cool, dark place. Well-cleaned implements, entirely of glass where they come in direct contact with the solution, must be used invariably throughout the entire process.—Merck's Rep., March, 1903, 70.

*Liquor Krameriæ Concentratus, B. P.—Improved Process of Preparation.*—F. C. J. Bird shows that the keeping properties of liquor krameriæ concentratus, which under the official conditions are very unsatisfactory, can be improved by the addition of about 5 per cent. more alcohol, or, better still, by adding 10 per cent. of glycerin. A preparation containing one-tenth its volume of glycerin remained bright, without deposit, when slightly acidified with acetic acid and allowed to stand for a few days, or when kept under ordinary conditions for some months, and also remained clear, without formation of any precipitate, when exposed to a temperature of about 0° C. Under similar conditions the official preparation yielded copious precipitates, while that containing 5 per cent. more alcohol also became turbid and gave a deposit, though in a lesser degree. Moreover, the preparation containing glycerin was rendered less turbid than the others on dilution with water, while its taste was somewhat more agreeable and its astringency practically the same.—Trans. Brit. Pharm. Conf., 1902, 461–465.

*Solution of Magnesium Citrate—Method of Sterilization.*—Herbert J. Watson states that micro-organisms make their appearance in the official solution of magnesium citrate in three to five days after preparation, the predominant organisms observed being *Penicillium glaucum*, *Saccharomyces ellipsoideus*, and bacteria of an unidentified character. He advocates the complete destruction of these deleterious organisms, in order to place this solution in the foremost rank of elegant pharmaceuticals, and proposes the following method for accomplishing this: "Place the filtered magnesium citrate solution in bottles with the syrup of citric acid and distilled water, then small plugs of cotton between the rubber stopper and neck of the bottle and sterilize for three days, fifteen minutes each day. Take small vials, 2 drachms each, place 35 grains of potassium bicarbonate in each, plug with cotton, and place in a dry oven or sterilizer for one hour at 150° C. When the bottles containing the solution are cool enough, carefully remove cotton, add the contents of a vial to the solution, and immediately stopper tightly. The resultant solution is stable and pleasant.—Proceedings Delaware Pharm. Society, 1902; Amer. Jour. Pharm., July, 1902, 345–346.

Referring to Mr. Watson's paper on the sterilization of solution of magnesium citrate, J. E. Huber makes the following practical suggestions: "In preparing the solution care should be taken in the selection of the magnesium carbonate, as that facilitates the filtration; one that is especially free from calcium carbonate should be employed. Free the solution of magnesium citrate from carbonic acid, which can be done by shaking or stirring, filter clear, and afterwards add syrup, but not syrup of citric acid, and finally enough water to make up the requisite volume. Formerly it was the custom after placing the right amount in each bottle to cork with a common good-quality cork. But now, with the rubber-stoppered magnesia bottle, it is only necessary to place the right amount in the bottle and turn the stopper, but not closing it absolutely tight, just enough to cover, so that a light pressure will spring the clip in place. When the bottles are filled place them in a vessel with a cover, and pour water around them until it rises to the line of the contained solution. The bottles must be raised in some manner, as on a perforated plate of some kind, from the bottom at least one-half an inch. Cover the vessel with the lid and place on the fire. When the water boils note the time, and allow to boil 40 minutes, remove the fire, then the lid, and immediately spring down the rubber tops, replace the lid and let all cool to room temperature. Then remove and store in a fairly cool place till wanted. When it is necessary to dispense a bottle, use one prepared as above, first placing 15 drops of soluble lemon essence in a regular magnesia bottle, empty the sterilized contents in it, add the requisite amount of bicarbonate of potassium, cork, and tie when it is ready to be labeled and delivered.—Drug. Circ., Oct., 1902, 202.

*Normal Saline Solution—Correction of Saline Strength.*—The strength of normal saline solution hitherto in use has varied between 0.6 and 0 7 per cent. of sodium chloride content, but, from a re-investigation of the subject by Dr. Fritz Engelmann, it appears that 0.9 per cent. more nearly corresponds to the requirements in the case of man and other mammals. The selection of lower concentrations seems to have been due to the use, in the first place, of such saline solutions in physiological research upon the lower animals—particularly in experiments upon the maintenance of excitability in excised muscle-nerve preparations of such animals as the frog. It should be observed that there is no necessity to imitate the quantitative composition of the blood serum so far as the relative proportions of the various salts present are concerned, but only to insure that the saline solution shall be isotonic with it, and sodium chloride is used for this purpose, since it is the salt which is present in preponderating proportion in the tissues.—Pharm. Journ., May 16, 1903, 675; from Deutsch. Med. Woch., 1903, 53.

*Antiseptic Thymol Solutions—Formulæ.*—George Roe gives formulæ

for several antiseptic thymol solutions. He recommends the following formula for an

*Inhalant Solution* in laryngitis and bronchial affections: Thymol, gr. vj; alcohol, 90 per cent., ℥i; magnes. carb., gr. iij; water, enough to make ℥i. Mix and filter. A

*Spray Solution*, useful in laryngeal and nasal catarrh, is obtained by dissolving: thymol, gr. ss, in rectified spirits, ℥ss, glycerin, ℥j, and comp. tincture of cardamom, ℥ss; adding enough warm water to make ℥viij. A

*Thymol Mouth-Wash*, having excellent refreshing and antiseptic properties, is obtained by the following formula: Salol, gr. v; thymol, gr. ii; oil of lavender, m v; oil of peppermint, m v; benzoic acid, gr. xx; glycerin, ℥ss; comp. tinct. cardamom, ℥ss; rectified spirits, enough to make ℥ii. M. Five drops to a wine-glass of water.—Chem. and Drugg., May 23, 1903, 812.

*Liquor Thyroidei, B. P.—Modification of Formula and Process.*—Attention having been drawn to the unsatisfactory keeping qualities of liquor thyroidei, B. P., when made according to the official directions, Edmund White has studied the problem and as a result recommends the following modification as producing a permanent and in all respects satisfactory preparation: Trim the glands, weigh, slice and bruise them, and for every 20 Gm. of tissue add 15 Cc. of glycerin. Macerate for twenty-four hours, strongly express, and make up the expressed product to the required volume by the addition of a mixture of equal parts glycerin and water. This procedure is based upon the assumption that the fresh thyroid tissue contains 75 per cent. of water, an assumption justified by the drying of a large number of samples in the water-oven at 100° C. The fluid present in the preparation will then be composed approximately of equal parts of glycerin and water by volume, and with this proportion the addition of phenol, chloroform, or other antiseptic is quite unnecessary.—Trans. Brit. Pharm. Confer., 1902.

*Essence of Diastase—Formula.*—The following formula for "essence of diastase" is recommended in "Merck's Report" (Dec., 1902, 482): Diastase, 40 grains; pancreatin, 40 grains; sodium bicarbonate, 15 grains; water, sherry wine, syrup, of each, 2 fl. ozs.; simple elixir, enough to make 16 fl. ozs.

## MISTURÆ.

*Mixtures—Determination of Quantities of Known Components by the Indices of Refraction.*—James B. Stevens communicates the results of some experiments undertaken with the view to ascertain the availability of the indices of separation of mixtures for the determination of known components of the same. The results would indicate that the law of Gladstone and Dale (see Preston's *Light*) holds good for this purpose within the

limits of measurement. If we know the relative volume of each component in the mixture, and the original refractive indices of the components, we may find that of the mixture.—Amer. Journ. Pharm., July, 1902, 577–579.

*Mixtures—Various Hospital Formulas.*—The following formulas for useful mixtures are given in the Pharmacopœia of St. Thomas' Hospital, (London):

*Bismuth Mixture:* Glycerin of bismuth (see under "Glycerita"), 30 minims; water enough to make 1 fl. oz.

*Bismuth and Soda Mixture:* Bismuth oxycarbonate, 15 grains; sodium bicarbonate, 10 grains; tragacanth, in powder, 1 grain; water, enough to make one fl. oz. Mix the tragacanth with the other powder and triturate to a smooth paste. The mixture may be made without tragacanth, if preferred, but the bismuth oxycarbonate subsides more quickly.

*Mistura Asafetidæ Composita:* Asafetida, picked, 5 grains; liquid extract of cascara sagrada, 10 minims; ammonium carbonate, 4 grains; infusion of valerian (1 in 40), to 1 fl. ounce. Triturate the asafetida to a smooth emulsion with the infusion, and decant from coarse particles. The ammonia in this mixture develops the taste and odor of the other constituents.

*Mistura Cascaræ Sagradæ:* Liquid extract of cascara sagrada, 30 minims; liquid extract of licorice, 30 minims; aromatic spirit of ammonia, 20 minims; chloroform water, to 1 fl. ounce. The ammonia prevents the formation of an unsightly deposit in this mixture. It loses its bitter flavor after standing several weeks.

*Mistura Cascaræ Sagradæ Composita:* Liquid extract of cascara sagrada, 20 minims; liquid extract of licorice, 30 minims; tincture of belladonna, 5 minims; tincture of nux vomica, 5 minims; aromatic spirit of ammonia, 20 minims; chloroform water, to 1 fl. ounce. The addition of nux vomica and belladonna increases the purgative action of the cascara. This mixture loses its bitter flavor after standing several weeks.

*Mistura Olei Morrhuæ:* Cod-liver oil, 4 fl. drachms; mucilage of gum acacia, 1 fl. drachm; syrup of tolu, 20 minims; gluside, $\frac{1}{16}$ grain; water, to 1 fl. oz. Emulsify the oil by trituration with the mucilage, adding a little water from time to time as the product becomes thick. In place of the mucilage, 30 grains of powdered gum acacia may be used, a fresh mucilage being made by first triturating the gum with 45 minims of water. This emulsion contains half its volume of oil, with the least possible quantity of gum; the taste of the oil is effectually disguised. Acids, alcohol, and crystalline salts, if prescribed with this mixture, except in small proportions, cause the oil to separate.

*Mistura Ferri Aromatica:* Solution of ferric chloride, 10 minims;

aromatic spirit of ammonia, 20 minims; syrup, 40 minims; water, to 1 fl. ounce. Mix the syrup with the iron solution, and add the aromatic spirit, previously diluted with the water. The sugar contained in the syrup, by this method of mixing, prevents the precipitation of the red ferric hydroxide, which would otherwise occur on mixing the liquid with the solution of a ferric salt. The resulting mixture is nearly neutral, and almost free from styptic taste.

*Mistura Jalapæ cum Rheo:* Jalap resin, ¼ grain; compound tinct. of rhubarb, 10 minims; tragacanth, ¼ grain; syrup of ginger, 5 minims; glycerin, 10 minims; caraway water, to 1 fl. ounce. Powder the resin, mix with the tragacanth, add the tincture, and then the other ingredients in the order given. Dose, 1 fl. drachm for a child one year old. The official extract of jalap varies considerably in strength; hence the resin of jalap is used, with tragacanth to suspend it.—Pharm. Jour., Nov. 15, 1902, 501.

*Blood Purifiers—Competitive Formulas.*—The Tennessee State Druggists Association having offered prizes for certain pharmaceutical preparations, the following formulas have been offered in competition for a blood purifier:

(1) A. B. Rains proposes: Potassium iodide, 4 ozs.; fl. ext. sarsap. co., fl. ext. stillingia co., fl. ext. yellow dock, āā, 8 ozs.; fl. ext. prickly ash, fl. ext. poke root, fl. ext. senna, āā, 1½ ozs.; fl. ext. licorice, 2 ozs.; fl. ext. cascara ar., 3 ozs.; glycerin, alcohol, āā 12 ozs.; sugar, 3½ lbs.; aqua dist., q. s., 4 pts. (sic. Rep.)

(2) B. B. Kerr proposes: Fl. ext. spla., 4 ozs.; fl. ext. yellow dock, 4 ozs.; fl. ext. taraxacum, 4 ozs.; fl. ext. senna, 2 ozs.; fl. ext. podophyllum, 1 oz.; oil sassafras, oil wintergreen, āā, 25 drops; alcohol, 4 ozs.; syrup, 8 ozs.; glycerin, 6 ozs.; potassium iodide, 1 oz.; water, q. s., 2 pts.

(3) J. Goldbaum proposes: Sarsaparilla, 24 ℔.; yellow dock, 16 ℔.; stillingia, dandelion, āā, 32 ℔.; senna, cascara sagrada, āā, 12 ℔.; iodide potash, 24 grs.; iodide iron, ⅛ gr.; aromatics, q. s., 1 oz.—Proc. Tenn. State Drug. Assoc., 1902, 50, 53 and 54.

*Celery Nervine—Formula.*—A. E. Hiss recommends the following formula for preparing a "celery nervine," the resultant preparation being a combined tonic, laxative, and diuretic:

| | |
|---|---|
| Celery seed | 12 oz. |
| Couch grass, cut | 12 oz. |
| Red cinchona, coarsely ground | 4 oz. |
| Senna leaves, cut | 8 oz. |
| Coca leaves, whole | 2 oz. |
| Rochelle salt | 4 oz. |
| Salicylic acid | 4 dr. |
| Iron phosphate, soluble | 10 dr. |
| Alcohol | 1 pint. |
| Water | to make 1 gallon. |

Boil the celery, couch grass, cinchona, and coca gently with 9 pints of water for about 5 minutes; to the warm liquid add the Rochelle salt, acid and senna, mix well, set aside for 24 hours, stirring occasionally, then express. To the liquid obtained add the iron phosphate dissolved in 4 fl. oz. of warm water, and the alcohol, and treat the marc with enough warm water so that when again expressed this liquid added to that previously obtained, will yield one gallon of fluid. Filter the mixture.—Merck's Rep., April, 1903, 98.

*Diarrhœa Mixture—Formula for Infants and Children.*—A. E. Hiss recommends the following formula for a diarrhœa mixture which he has found useful in the summer bowel-complaints of children:

| | |
|---|---|
| Tincture catechu, or kino | 1 fl. dr. |
| Fluid extract rhubarb | 1 fl. dr. |
| Glycerin | 4 fl. dr. |
| Compound chalk powder | 2 dr. |
| Bismuth subnitrate | 1 dr. |
| Cinnamon water | to make 2 fl. oz. |

One-half to one teaspoonful is the dose, to be repeated every ½, 1, 2 or 3 hours, according to the severity of the case.—Merck's Rep., April, 1903, 98.

*Earache Drops—Formula.*—A. E. Hiss recommends the following formula for "earache drops:

| | |
|---|---|
| Cocaine hydrochlorate | 10 gr. |
| Chloral camphor | 3 fl. dr. |
| Alcohol | 3 fl. dr. |
| Chloroform | 3 fl. dr. |
| Castor oil | to make 2 fl. oz. |

Merck's Rep., April 1903, 98.

*Menthol Mixtures—Preparation by the Aid of Tincture of Quillaia.*—On account of the slight solubility of menthol and peppermint oil in water, it is often necessary to have recourse to high-priced alcoholic solutions. Dr. Crèsantignes therefore proposes to dissolve menthol first in tincture of quillaia, and to add this solution to the water in small portions. It is stated that in this manner clear and permanent menthol mixtures can be obtained, for example:

| | |
|---|---|
| Menthol | 0.15 to 0.3 g. |
| Tinct. quillaiæ | 10.0 g. |
| Aq. qu. s. ad. | 150.0 Cc. |

The following precipitation is given for a mouth-wash:

| | |
|---|---|
| Menthol | 0.1 to 0.2 g. |
| Tinct. quillaiæ | 20.0 g. |
| Sol. acid. boric., 1 per cent | 1000.0 g. |

For internal use the mixture may perhaps not be suitable, on account of the toxic properties of quillaia-tincture.—Schimmel's Rep., April–May, 1903, 99; from Rép. de Pharm., 1903, No. 1.

*Salol Mixtures—Desirability of the Emulsionized Form with Almona Oil.*—Prof. P. E. Hommell suggests that the attention of physicians be directed to the advantage of dispensing salol mixtures in an emulsionized form, using almond oil for this purpose.—Proc. New Jersey Pharm. Assoc., 1902, 74.

MUCILAGINES.

*Mucilage of Acacia—Practical Manipulation.*—J. P. Gilmour recommends, when preparing mucilage of acacia, to enclose the gum in fine muslin and run water from a tap through it for a minute or two; then suspend the bag from the mouth of a suitable vessel in the required quantity of water, so that the gum may be just covered. Solution is completed over night, and if the gum be pure and clean, no additional clearing is necessary.—Pharm. Jour., Jan. 24, 1903, 94.

*Mucilaginous Face Creams—Preparation.*—A. E. Hiss, speaking of "mucilaginous face creams," says that these may be made with linseed or quince seed, but the most suitable mucilaginous ingredient for all purposes is tragacanth, a good formula being the following:

| | | |
|---|---|---|
| Tragacanth, whole pieces | 240 | grs. |
| Boric acid | 1½ | oz. |
| Water | 3 | pints. |
| Glycerin | 8 | fl. oz. |
| Alcohol | 8 | fl. oz. |

Dissolve the boric acid in the water by the aid of heat; to the hot liquid add the tragacanth, and stir occasionally with a spatula or broad paddle of some kind, until the gum is thoroughly softened. Then add the alcohol and glycerin, strain the mixture forcibly through cheese cloth, and pass enough water through the cloth so that the liquid will measure 64 fl. ozs. If somewhat too thick, it may be diluted with more water.

If this mixture be perfumed with essence of bitter almond, it may be called "almond cream;" if perfumed with some rose extract, it is usually known as "favorite cream;" if in addition to being perfumed with rose it is also colored pink, it is usually called "rose cream;" if perfumed with violet extract and colored purplish, it may be called "violet cream," or "cream of violets," etc. A nice

"*Benzoin Cream*" may be made by the addition of 1 oz. each of borax and coarsely powdered benzoin to the above ingredients. Boil the benzoin with the borax, acid, and water for about 5 minutes, strain, and add water through the strainer to make 3 pints. In this liquid macerate the tragacanth and proceed as in the preceding formula.—Merck's Rep., March, 1902, 68.

*Toilet Creams and Cosmetics—Addition of Hydrogen Dioxide.*—Kuhl recommends the addition of hydrogen dioxide to several toilet creams and cosmetics. A "skin cream" is prepared by saturating lanolin with a solution of hydrogen dioxide; a "glycerin lotion" by mixing together: glycerin, 40 parts; rose water and solution hydrogen dioxide, of each, 20 parts; a "tooth paste" from: precipitated calcium carbonate, 25 parts; powdered soap, 5 parts; glycerin and solution of hydrogen dioxide, in equal quantities, sufficient to make a paste, which may be perfumed, according to taste, with oil of bergamot, oil of peppermint, or oil of lavender. —Apoth. Ztg., 1903, 81.

*Toilet Cream—Formula.*—J. T. Pepper recommends the following formula for preparing a toilet cream which is sightly, pleasing to the user, and proves effective:

| | |
|---|---|
| Quince seed | 45 Gm. |
| Boric acid | 30 Gm. |
| Glycerin | 600–700 Cc. |
| Alcohol, deodorized | 250 Cc. |
| Distilled water | 3,000 Cc. |
| Tinct. benzoin | 15 Cc. |
| Menthol | 0.15 Gm. |
| Ex. white rose | 10 Cc. |
| Oil of bergamot | 1 Cc. |

Macerate the quince seed and boric acid in the water for forty-eight hours, shaking thoroughly and frequently the while; then strain, add the glycerin and finally the perfumes, menthol and tincture of benzoin, all previously mixed with the alcohol. It is a good precaution to carefully break the quince seed into a clean iron mortar, care being exercised not to crush or powder the dark, outer coating of the seed, for if this is done the preparation will be darkened by it, and it is greatly to be desired to have it as light in color as possible; if it is white, so much the better. It is also a good idea to macerate the quince seed in hot or warm water for a part of the forty-eight hours. It will produce a thicker mucilage and give more body to the finished preparation.—Amer. Drug., March 23, 1903. 157.

*Linseed Cream—Formula.*—The following formula for a "toilet cream" made with linseed is given in "Merck's Report" (June, 1903, 173):

| | |
|---|---|
| Linseed | 40 parts. |
| Water | 250 parts. |
| Glycerin | 32 parts. |
| Alcohol | 48 parts. |
| Cologne water | 4 parts. |
| Carbolic acid | 2 parts. |
| Boric acid | 0.2 parts. |

Dissolve the boric acid in the water, and in the solution macerate the seed for three days, agitating frequently. Strain off through coarse muslin, and add the glycerin, carbolic acid, alcohol and cologne, under constant agitation. Let stand for a day or two, then strain through fine cloth.

*Honey and Almond Cream—Various Formulas.*—The following formulas for so-called "Honey and Almond Cream" are recommended in "Merck's Report" (Aug., 1902, 336):

| | | |
|---|---|---|
| No. 1. | Bitter almonds | 1 oz. |
| | Yolk of egg | 1 fl. oz. |
| | Honey | 1 fl. oz. |
| | Expressed oil almond | 2 parts. |
| | Oil bergamont | 15 min. |
| | Oil lemon | 12 min. |
| | Oil cloves | 12 min. |

The almonds are macerated in hot water and then decorticated, bruised, and rubbed through a fine sieve; then the essential oils and the mixture of the yolk of egg, honey, and expressed oil of almond are added, and the whole well beaten together until the ingredients are intimately mixed.

| | | |
|---|---|---|
| No. 2. | Cold cream | 5 parts. |
| | Expressed oil almond | 1 fl. oz. |
| | Glycerin | 5 parts. |
| | Boric acid | 5 parts. |
| | Solution soda | 12 parts. |
| | Mucil. Quince seed (1:8) | 25 parts. |
| | Water | 140 parts. |
| | Essential oil almond | sufficient. |
| | Oil rose | sufficient. |

Heat the cold cream, oil, and soda solution together, stirring constantly until an emulsion is formed; then heat together the glycerin, boric acid, mucilage, and water, mix with the emulsion, stir until cold, and add enough water to make 200 parts, finally, add the perfume.

| | | |
|---|---|---|
| No. 3. | Honey | 2 oz. |
| | Powdered castile soap | 1 oz. |
| | Expressed oil almond | 26 fl. oz. |
| | Essential oil almond | 1 fl. dr. |
| | Oil bergamot | 1 fl. dr. |
| | Oil cloves | 15 drops. |
| | Balsam Peru | 1 fl. dr. |
| | Solution of potassa | sufficient. |
| | Solution of carmine | sufficient. |

Mix the honey with the soap in a mortar, and add enough potassa solution (about 1 fl. dr.) to produce a nice cream; then mix the volatile oils and balsam with the expressed oil of almonds, mix this with the cream, and continue the trituration until thoroughly mixed; finally add (if desired) enough carmine solution to impart a rose tint.

No. 4. A perfectly white emulsion may be obtained by mixing 4 parts of expressed oil of almond with one part of powdered acacia in a dry mortar, and then adding at once two parts of water and triturating. Sufficient rose water is then added to yield a mixture of suitable consistency. If desired, a little glycerin may replace part of the rose water.

*Witch Hazel Cream—Formula.*—H. P. Pettigrew recommends the preparation of "witch hazel cream" by using most any one of the published formulas for "quince-seed lotion," except that the quince seed is to be macerated in about half the directed quantity of water, the other half to be replaced by the same amount of distilled extract of witch hazel. For a two-gallon batch of this use the following perfume: Tincture of benzoin, 2 ozs.; oil of bergamot, 1 oz.; extract of pansy blossom, 2 ozs.; alcohol, 3 ozs.; essence of bitter almond, 5 fl. drachms.—West. Drug., Feb., 1903, 62.

*Witch Hazel Jelly—Formula.*—The following formula for "witch hazel jelly" is recommended in "Merck's Report" (Dec., 1902, 482): French gelatin, 1 oz.; glycerin, 3 fl. ozs.; dist. ext. witch hazel, 20 fl. ozs. Dissolve the gelatin in the glycerin and witch hazel by means of a water-bath. Perfume may be added as desired. It may be dispensed in bottles or in collapsible tubes.

OLEA.

*Iodized Cod-Liver Oil—Formula.*—The following formula for iodized cod-liver oil is suggested in "Bull. de Phar. de Lyon:" Iodine, 1.0 Gm.; chloroform, 2.0 Gm.; cod-liver oil, enough to make 1000.0 Gm. The iodine, dissolved in the chloroform, is added to the oil.—Apoth. Ztg., 1903, 252.

*Iodized Oils—Determination of Iodine.*—L. Lafay observes that the iodized oils of commerce usually contain much less iodine than advertised, and that, in addition to iodine, considerable quantities of chlorine are also present. He gives the following method for determining the amount of iodine, either alone or in the presence of chlorine: Weigh about 1 Gm. of the oil into a nickel, iron, or copper crucible, add 5 or 6 Gm. of caustic potash free from chlorine, and 5 or 6 Cc. of alcohol; warm gently to saponify the oil, and evaporate until the residue, which contains free potash, begins to darken; cover the crucible and continue to heat until the mass froths up and the organic matter is destroyed, and exhaust the residue with water; acidify the solution with sulphuric acid and transfer it to a 500 Cc. stoppered flask; add 20 to 30 Cc. of carbon disulphide (previously washed with potassium permanganate) and a few drops of a concentrated solution of sodium nitrite; shake well for five minutes and transfer the aqueous solution to a 2-liter flask; wash the carbon disulphide twice with 200 Cc. of water, transferring the washings to the flask; remove the traces of iodine from the washings by shaking with 10 to 15 Cc. of carbon disulphide, and add this to the other; determine the amount of

iodine by titration with volumetric solution of sodium hyposulphite. To determine both iodine and chlorine, acidulate the alkaline solution obtained from the calcined residue with nitric acid and precipitate with silver; wash the precipitate and boil it for two or three minutes with a solution of sesquicarbonate of ammonia (ammonium carbonate, 10 Gm.; water, 90 Cc.; solution of ammonia, 22 Cc.); the chloride is dissolved, the iodide remains undissolved; both can be determined in the usual way.—Pharm. Journ., June 27, 1903, 867; from Bull. des Sciences Pharm., *5*, 119.

OLEATA.

*Zinc Oleo-Stearate—Working Formula.*—In response to a query for practical formulas for preparing oleates, oleo-palmitates and oleo-stearates, Frederic E. Niece communicates the following working formulas for preparing zinc oleo-stearate: Three solutions are required for this purpose:

*Solution of Zinc Acetate*, obtained by dissolving 200 grains of zinc acetate in 2 ounces of distilled water, and straining if necessary; and

*Solution of Potassium Oleo-Stearate*, obtained by dissolving 80 grains of potassium hydrate in 2 ounces of 95 per cent. alcohol (= No. 1) and mixing this with another, as below directed, obtained from 325 grains of stearic acid, 80 grains of oleic acid, and 3 ounces of 95 per cent. alcohol (= No. 2). Warm the stearic acid in a glass vessel to just its melting point; to this add the oleic acid previously warmed to just its boiling point and mix the two acids intimately with a glass rod. Now add the alcohol, which has been warmed to just its boiling-point, and mix all three together thoroughly by constant stirring until cool. After cooling, if any hard lumps are noticeable in the mixture, they should be removed by heating, then straining through a piece of wide-meshed cloth, then cooled again by constant stirring. Now heat solutions No. I and No. II to just their boiling-points and quickly as possible pour the two solutions simultaneously into a gallon-glass or porcelain vessel. Stir the resultant mixture vigorously until it becomes cool. The result is a thick, soapy, alcoholic solution of oleo-stearate of potash. Gently reheat the above solution again to a lukewarm state and to it add 2 pints of boiling distilled water and again mix completely by vigorous agitation. After a complete mixture is obtained, quickly as possible pour into it the prepared solution of zinc acetate which has been warmed to just its boiling-point and thoroughly stir this combined solution to a uniform mixture until cool, which then has a creamy consistency. When cool, add two more pints of boiling distilled water and stir this mixture until this is also cool. The precipitate of zinc oleo-stearate is collected on draining cloth, washed with warm water until the washings are perfectly neutral, dried thoroughly, and then reduced to an impalpable powder by trituration.

*Zinc Oleo-Palmitate* is obtained by substituting 450 grains of palmitic acid for the stearic acid in the above process; while the

*Oleo-Stearates and Oleo-Palmitates of Copper, Lead or Mercury*, are obtained by using the acetates of these metals in place of zinc acetate—otherwise following the same directions.—Proc. Pa. Pharm. Assoc., 1902, 135–138.

PULVERES.

*Powders—Apparatus for Dividing Them in Prescription Work.*—In reference to a query, I. M. Weills describes a device (shown by Figs. 30 and 31) and its use, as follows: It is composed of three pieces. No. 1 is

FIG. 30.

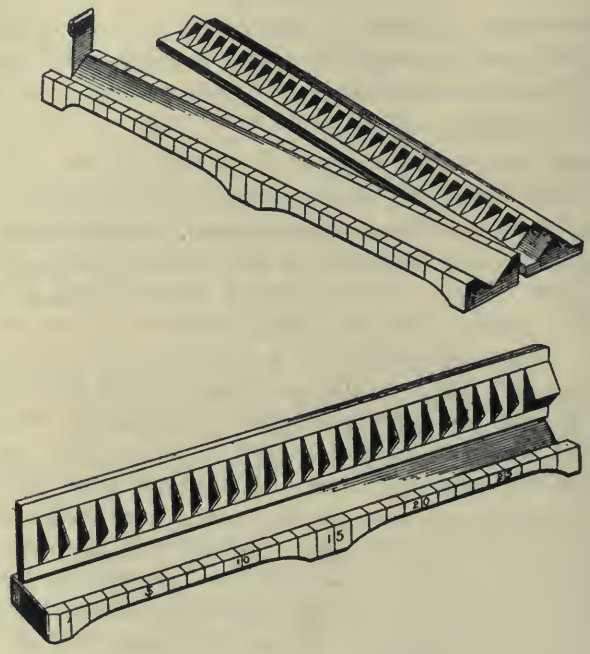
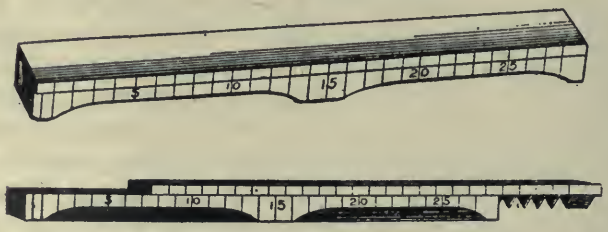


FIG. 31.




**Powder Divider for Prescription Work.**

the base, and is 7¾ inches long, 1 inch wide, and $\frac{7}{16}$ inch thick, and has a V-shaped groove plowed out of the top ⅝ of an inch wide at the upper end of the V, and is $\frac{9}{32}$ of an inch deep. At one end there is a gate

swinging on a screw, which allows it to move up and down freely to close the end of the V. On the edge it is laid off in quarter inches, and numbered by five, ten, fifteen, twenty and twenty five; thus every fifth mark is numbered.

The second piece is simply a strip of brass $\frac{1}{32}$ of an inch thick, and as large as the end of the first piece.

The third piece is the same length and width as the first. It is $\frac{1}{8}$ of an inch thick, and on the underside there are twenty-seven knife blades $\frac{1}{4}$ of an inch apart, and a block $\frac{3}{8}$ of an inch long made to fit in the groove in the top of the first piece, and marked on the edge the same as piece No. 1.

When parts one and three are placed together the knife blades fit in the groove, and the marks on the edge of each piece come together and form one line. To operate the machine turn the gate so that the end of the groove is closed by it, then reverse the top-piece so that the block will fill the groove. Now, if you wish, say fifteen powders, simply place the block-end at fifteen, dump your powder in the groove. Now lift part three and reverse it to proper position. Place part three on part one and bring them together, having previously distributed your powder papers. Take up the divider and turn back the gate on part one, place the end of the divider over the powder paper and slide part three along, when the powder will be shoved out of the end of part one by the blade on part three. Now simply continue to move the divider from paper to paper, and shoving the parts as for the first powder, until all have been shoved out, thus making an even distribution.—Proc. Pa. Pharm. Assoc., 1902, 106, 107.

*Face Powders—Practical Formulas.*—The following formulas for "face powders" are recommended in "Merck's Report" (Sept., 1902, 366):

| | | |
|---|---|---|
| No. 1. | Precipitated chalk | 23 parts. |
| | Powdered talcum | 24 parts. |
| | Bismuth subcarbonate | 7 parts. |
| | Zinc oxide | 17 parts. |
| | Corn starch | 30 parts. |
| | Oil rose (or rose geranium to suit). | |
| No. 2. | Powdered talcum | 56 parts. |
| | Precipitated chalk | 31 parts. |
| | Bismuth oxychloride | 13 parts. |
| | Perfume to suit. | |
| No. 3. | Magnesium carbonate | 1 part. |
| | Powderad talcum | 2 parts. |
| | Perfume to suit. | |
| No. 4. | Powdered talcum | 55 parts. |
| | Precipitated chalk | 35 parts. |
| | Bismuth oxychloride | 10 parts. |

A pink tint can be imparted to the above by the addition of finely powdered carmine; a flesh tint, by adding burnt umber or yellow ochre.

*Borated Talcum Powders—Formulas.*—According to A. E. Hiss a "borated talcum powder" may be prepared by mixing 8 ozs. of powdered boric acid with 4 fl. drams of oil of rose-geranium, and when well mixed incorporating it with 4½ lbs. of powdered talcum. A much finer and smoother powder, having an exquisite odor, is, however, obtained as follows: Mix 4 ozs. of boric acid, in impalpable powder, with 4 fl. drachms of oil of jasmine; incorporate this with a mixture of 4 ozs. of zinc stearate and 4½ lbs. of talcum in fine powder, and pass the product through a moderately fine sieve. A fine "violet talcum powder" is obtained by omitting the oil of jasmine and adding instead 4 to 8 ozs. of finely-sifted orris root and a small quantity of spirit of ionone. Merck's Report, March, 1903, 67.

*Effervescent Fruit Selzer—Formula.*—Edmund Jenner gives the following formula for the preparation of a palatable and thoroughly efficient saline laxative:

| | | |
|---|---|---|
| R, | Pulv. sod. et pot. tart. | aa ℥ viii. |
| | " acid tart | |
| | " sodii bicarb. | |
| | " potass. bitart | ℥ iv. |
| | Magnes. levis | ℥ ss. |
| | Saccharin. | gr. vi. |
| | Ol. limon | ℥ i. |

Mix the oil of lemon and saccharin with the magnesia, add the sodium bicarbonate and Rochelle salt, then sift. Mix and sift the other ingredients. Thoroughly dry the mixtures separately at about 90° F. Then mix and sift again. Bottle immediately into clean, dry bottles, and fill within about half an inch of the top.—Pharm. Journ., July 26, 1902, 83; from Canadian Druggist, *14*, 115.

## PILULÆ.

*Pills—Device for Taking.*—The simple device shown by Fig. 32 is described in "Pharm. Ztg." (1902, 560) and is intended to facilitate the swallowing of pills. It consists of a glass tube bent to a slightly obtuse angle, as shown. In the upper, nearly horizontal limb, two or three depressions are made in the tube, causing slight projections on the inner surface. These projections hold the pills dropped into this limb. The other limb is placed in a tumbler of water or other suitable liquor; on applying suction now, the pill is washed from its seat by the liquid and swallowed with the latter. It is stated that two or three pills may be readily taken at a time by means of this device.—Merck's Rep., Sept., 1902, 355.

FIG. 32.

Device for Taking Pills.

*Blaud's Pills—Origin.*—John Humphrey has taken the trouble to trace

the origin of Blaud's pills, from which it appears that in 1831 Dr. Cottereau called attention to certain pills the composition of which had been communicated to the "Académie Royale de Médicine" by a provincial medical man, who had found them useful in cases of chlorosis. Dr. Cottereau, furthermore, stated that a pharmacist, Guillard, made pills, presumably similar, using *2 drachms* each potassium carbonate and pure crystallized ferrous sulphate for 48 pills, which were silver coated; whereupon, early in 1832, a protest appeared from Dr. Blaud, head physician of the Hospital Beaucaire, Gard, in which he called attention to the incorrectness of the formula published by Dr. Cottereau, the one devised by him calling for *1 ounce* of each ferrous sulphate and potassium carbonate, both in fine powder, to be made into 96 pills, with mucilage of tragacanth to make the mass, and powdered licorice to prevent them from adhering to each other. It is thus evident that Dr. Blaud was the "provincial medical man" referred to by Dr. Cottereau. It is useless to follow the history of these pills further than to say that they have under various modifications, but with substantially the same ingredients, been adopted in various Pharmacopœias—in the French, the "Codex Medicamentarius" in 1866, up to the British Pharmacopœia of 1885, while other Pharmacopœias adopted formulas between these dates. In this connection, Mr. Humphrey calls attention to the fact that the original formula for

*Vallet's Pill Mass*, which closely resembles Blaud's pills in composition, was communicated to the "Académie Royale de Médicine" in February, 1837, and published in the Journal de Pharmacie in June, 1838; and that a modification of the original formula became official in the 1866 Codex under the title "Pilules de Protocarbonate de Fer selon la Formale de Vallet." That this pill mass is official in some form or other in several of the modern Pharmacopœias is well known.—Pharm. Journ., May 9, 1903, 643.

RESINÆ.

*Eclectic Resins, Concentrations and Resinoids—Origin and Nomenclature.*—Prof. John Uri Lloyd communicates an interesting article on the origin and nomenclature of the eclectic resins, concentrations and resinoids, accompanied by a facsimile copy of a letter, dated August 6, 1880, of the late Dr. John King, from which the following facts are elicited: 1. The article to which the term "leptandrin" is applied, was first described by Dr. King in the "Western Medical Reformer" in 1846, in an article in which he also called attention to the resins of blue flag, black cohosh, podophyllum, etc.; but the so-called leptandrin was prepared by him as early as 1840, by first preparing an extract of the leptandra virginica root, by forming an alcoholic tincture and an aqueous infusion, then evaporating these separately, pulverizing and mixing them. 2. Previous to the period referred to (1840), these resins and preparations were unknown to physicians and pharmacists. 3. As to the nomenclature given

to these resins and dried extracts, it did not originate with him. Prof. Lloyd says this in reference to these preparations:

Discovered by accident; introduced by a talented scholar but yet a man classed with charlatans by the regular medical profession; attacked by factions and simultaneously viciously assailed from within and without, the eclectic "resinoids" ran their course and left their mark in the form of a few that creditably remain. These preparations were all enthusiastically supported by those who in some instances strangely enough antagonized their discoverer, and they were next as a class bitterly denounced by that discoverer, the father of them all, who turned and fought illogical abuses that arose in the field he had hoped his school would rationally develop. Dr. John King was an eclectic, he discovered podophyllin, he added thereto a few similar energetic vegetable products such as the resins of blue flag, cimicifuga, iris versicolor, etc., and next, to his distress, he saw a multitude of unknown, unworthy mixtures rapidly thrown upon the market under the name "resinoid." As different in composition as it was possible to imagine compounds said to be uniform were many of these; as worthless too were they in some instances as are mixtures of calcined magnesia and a little extractive matter of uncertain structure. The first of the American resinoids "podophyllin" was named "resin of podophyllum" by its discoverer, Dr. John King, who called it *resin of podophyllum* not "podophyllin." This gave to the class its birth and in it the life of those now remaining is largely vested.—Drug. Circ., Jan., 1903, 4–5.

*Resin of Podophyllum—Determination of Quality.*—After briefly reviewing the opinions expressed by different authorities as to the conditions which a genuine sample of resin of podophyllum should fulfil, S. Taylor gives the results of an examination of thirteen commercial samples of the resin, in the form of a table which may be consulted in the original. The facts revealed by the results embodied in this table lead him to the following conclusions:

(1) That the pharmacopœial standard of 1 per cent. of ash is justifiable.

(2) That the solubility in solution of ammonia is not of much value.

(3) That the insolubility in 90 per cent. alcohol should not exceed 5 per cent.

(4) That Squire's limit of 50 per cent. soluble in chloroform is a good criterion.

(5) That at least 40 per cent. of the original resin should be precipitated from the chloroformic solution by petroleum ether.

(6) That 60 per cent. should be soluble in pure ether, and that the residue should consist principally of a resinous and sticky body.

With regard to the samples themselves, none of them appear to have been the product of *Podophyllum emodi*, since they all failed to give a reaction

with Millard's $H_2SO_4$ test. Only four of the thirteen failed to fulfil the conditions required.—Pharm. Jour., Oct. 11, 1902, 368.

*Podophyllum Resin—Solubility of Commercial Specimens.*—A. Russell Bennett has examined ten commercial specimens of podophyllum resin with the object of ascertaining how far this drug as found in the English market corresponds to the character demanded by the B. P. The results are exhibited in the following table:

| Number. | Source. | Solubility in 90 per cent. Alcohol. | Solubility in Ether. | Ash per-centage. | Color. |
|---|---|---|---|---|---|
| 1..... | British . ... | 80 per cent. | 77.5 per cent. | 2.31 | Orange. |
| 2..... | Foreign .... | 84 " | 76.2 " | 2.73 | Yellow. |
| 3..... | Foreign .... | 90 " | 73.1 " | 2.90 | Pale yellow. |
| 4..... | British ..... | 93 " | 71.52 " | 2.10 | Pale orange. |
| 5..... | British ..... | 95 " | 73.0 " | 0.75 | Pale orange. |
| 6..... | Foreign .... | 90 " | 70.0 " | 1.43 | Pale orange-brown. |
| 7..... | Foreign .... | 94 " | 68.0 " | 1.64 | Deep yellow. |
| 8..... | British ..... | 88 " | 69.0 " | 1.90 | Orange-brown. |
| 9..... | British ..... | 90 " | 74.0 " | 1.39 | Deep orange-brown. |
| 10..... | British ..... | 86 " | 76.0 " | 1.75 | Orange-brown. |

It is evident that podophyllum resin, soluble or nearly so, in 90 per cent. alcohol, is not a plentiful article in the English market.—Phar. Jour., Feb. 21, 1903, 238.

## SAPONES.

*Soap—Cause of Detergent Power.*—H. W. Hilges concludes that the cleansing power of soap is largely or entirely explained by the property which it has of emulsifying oily substances, of wetting or penetrating into oily textures, and of lubricating texture and impurities so that they may be removed easily. He thinks that all of these properties may be explained by taking into account the low cohesion of the soap solutions and their strong attraction, adhesion or affinity to oily matter, which together cause the low surface tension between soap-solution and oil.—Journ. Amer. Chem. Soc., *25*, 511.

*Soap—Estimation of Sodium Chloride.*—In order to prove the correctness of a method for the estimation of sodium chloride in bar soap, A. R. Barnes prepared some soap from chlorine-free materials and carried out the following experiment: Ten Gm. of this pure soap were dissolved in water in a six-ounce beaker. To the solution a known quantity of pure sodium chloride was added, the fatty acids then thrown up with sulphuric acid and the beaker and contents heated on the water-bath until the aqueous layer became clear. The beaker was allowed to cool, then the cake of fatty acids was pierced in two places and the aqueous layer poured into a separating funnel. The fatty acids and the interior of the beaker

were then well washed with cold water, and the washings added to the liquor in the funnel. Petroleum ethers (all over under 80° C.) were added and the funnel well shaken in order to extract traces of dissolved fat acid. After separation, the aqueous layer was run into an eight-ounce conical flask, one drop of phenolphthalein indicator added, and ammonium hydrate added until solution became just pink. The flask was then placed on the water-bath and left until any retained petroleum ether was driven off, and then boiled until the vapors showed no reaction with red litmus paper. The liquor was then cooled and titrated in the usual way with $\frac{N}{10}$ $AgNO_3$. Afterwards a little nitric acid and excess of silver nitrate were added, and the sodium chloride determined gravimetrically. The results of the estimation, both volumetrically and gravimetrically, proved the correctness of the method.—Chem. News, Oct. 10, 1902, 183.

*Castile Soap—Commercial Quality.*—The U. S. Pharmacopœia states that a hot 4 per cent. alcoholic solution of castile soap should not gelatinize on cooling. Robert C. Pursel and Willard Graham have examined several samples and found all to respond to this requirement, with a single exception; this particular sample did not have the appearance of a pure olive oil soap.—Proc. Pa. Pharm. Assoc., 1902, 147.

*Disinfectant Soaps—Inefficiency.*—According to a very exhaustive examination and inquiry into the nature and value of disinfectant soaps, by F. Tonzig, the addition of disinfectants to soap is useless. The disinfectants appear to lose their specific action when so combined, and the so-called disinfectant soap is no more effectual than the original soap itself. —Monat. f. Dermat., 1902, 348.

*Liquid Soap—Formula.*—A. E. Hiss gives the following formula for preparing a liquid soap for toilet, surgical and other purposes: Cocoanut oil, 16 fl. ozs.; oleic acid, pure, 8 fl. ozs.; alcohol, 16 fl. ozs.; water, 24 fl. ozs.; potassium carbonate, 6 drams; caustic soda (? Rep.) or potassa, 6 ozs. The oil, if solid, is first melted in a water-bath, and the ingredients are put into a bottle in the order given. The lye will settle to the bottom of the bottle, so that if the mixture be agitated from time to time, the oil and the acid will saponify and be dissolved, and when all is saponified, the liquid may be decanted from the excess of lye and thus excess of alkalinity be avoided. The author says it is not necessary to use pure caustic soda or potassa, as the common lye or potash will answer the purpose equally well. If to be used for toilet purposes, this soap may be perfumed, according to taste; if for surgical use it may be made antiseptic with ether, cresol, thymol, resorcin, or other suitable agent.—Merck's Rep., March, 1903, 67.

*Liquid Antiseptic Soap—Preparation without Ether.*—T. Antoine proposes the following formula for preparing a liquid antiseptic soap without ether, which, he claims, leaves the skin soft after use—whereas the liquid

ether soap leaves it dry and hard: 50 Gm. of caustic potash in strong aqueous solution, 200 Gm. of almond oil (being a slight excess) and 100 Gm. of glycerin are mixed, followed by 700 Cc. of distilled water, and the mixture is digested on a water-bath at 66° to 70° C. for 24 to 36 hours. The thin layer of unsaponified oil having been carefully removed from the surface, the lower portion forms a thick jelly-like soap. 900 Gm. of this soap are digested with 100 Gm. of alcohol, in which the desired antiseptic and (odorous? Rep.) essences may be dissolved, for some hours at 60° C. After some days, the liquid is filtered to remove crystals of potassium stearate, and the homogeneous soap is ready for use. —L'Union Pharm., *44*, 52.

*Solutio Saponis Aetherea—Formula.*—The following formula for an "Ether-soap" is given in the Pharmacopœia (Ed. 1902) of St. Thomas' Hospital (London): Oleic acid, 7 fl. ounces; alcohol (90 per cent.), 3 fl. ounces. Mix, and neutralize with a saturated solution of potassium hydroxide in water (1 in 1), of which nearly 1½ fl. ozs. will be required, using phenolphthalein as indicator. Allow the neutralized product to cool, and add: Oil of lavender, 20 minims; methylated ether, sp. gr., 0.720, sufficient to make 1 pint (imp. meas.); preserve in well closed bottles. The detergent action of this solution may be increased by using a slight excess of potash solution. Ether-soap solution is used to cleanse skin-areas before surgical operations. A small quantity should be well rubbed in until the surface is dry, then, with a brush and hot water, thoroughly scrub the skin. The ether, being a fat-solvent, penetrates the epidermis and carries the soap with it.—Pharm. Journ., Nov. 15, 1902, 501.

*Iodine-Soap Solutions—Formulas.*—Herbert Skinner gives several formulas for saponaceous iodine solutions in use at the Great Northern Central Hospital, which have the advantage over alcoholic solutions of iodine in their non-staining properties. One formula directs 1 oz. iodine; 2 fl. ozs. oleic acid; 3 fl. drachms liq. ammon. fort.; enough paraffin oil to make 1 pint (imp. meas.? Rep.). Another is made by dissolving 1 oz. of iodine in 5 ozs. of alcohol, by the aid of 1 oz. of solution of ammonium oleate, and adding glycerin to make 1 pint.—Pharm. Journ., May 9, 1903, 641; from Br. Journ. Dermat. (15), *4*, 125.

*Aseptic Surgical Shaving Paste—Formula and Application.*—Edmund White, of St. Thomas' Hospital, London, has used with advantage an aseptic shaving-paste to be used in place of lather on surfaces requiring shaving prior to surgical operations. The formula as now perfected by experience is as follows: Hard paraffin (m. p. 55° C.), 22 parts; prepared suet, 3 parts; soft soap, 2 parts; boiling water, 68 parts—all by weight. Place these materials in a vessel surrounded by boiling water, and when melted, beat them together until a smooth, white emulsion is obtained. Continue the beating, maintaining the temperature above 70° C., and

shake in gradually 2 parts of powdered tragacanth. When the mixture is homogeneous, allow it to cool, and when nearly cold, add 2 parts of glycerin and 1 part of oil of lavender. In use, a small quantity of this paste —more or less according to circumstances—is rubbed over the area to be shaved and the razor immediately applied.—Trans. Brit. Pharm. Conf., 1902, 415–417.

*Polishing Soaps — Practical Formulas.*—The following formulas for making "polishing soaps" are given in "Merck's Report" (Aug., 1902, 336):

| | | |
|---|---|---|
| No. 1. | Powdered pipeclay | 20 parts. |
| | Tallow soap | 13 parts. |
| | Tartaric acid | 1 part. |

Grind until pasty, afterwards press into blocks.

| | | |
|---|---|---|
| No. 2. | Levigated flint | 12 parts. |
| | Whiting | 10 parts. |
| | Tallow | 4 parts. |
| | Caustic soda | 1 part. |
| | Water | 3 parts. |

Dissolve the soda in water, and add to the tallow, when saponified stir in the others, pressing as before.

| | | |
|---|---|---|
| No. 3. | Saponified cocoanut oil | 32 parts. |
| | Kieselguhr | 7 parts. |
| | Alum | 3 parts. |
| | Flake white | 3 parts. |
| | Tartaric acid | 1 part. |

Make as before.

| | | |
|---|---|---|
| No. 4. | Tallow soap | 49 parts. |
| | Liquid glycerin soap | 7 parts. |
| | Whiting | 9 parts. |
| | Levigated flint | 7 parts. |
| | Powdered pipeclay | 7 parts. |

## SPIRITUS.

*Aromatic Spirit of Ammonia, U. S. P.—Composition and Method of Assay.*—Gordon L. Curry has made a series of experiments to determine the composition of aromatic spirit of ammonia when made from the commercial carbonate and ammonia water containing 10 per cent. gaseous ammonia. He had found the commercial carbonate to respond well to the purity test of the U. S. Pharmacopœia, the results of assay ranging from 97 per cent. to 99.2 per cent. pure salt. With material of such purity, which is readily obtainable, he finds on calculation that the 90 Cc. of aqua ammonia directed for the conversion of the bicarbonate into nor-

mal carbonate of ammonium is more than is necessary, and in consequence the finished spirit contains both normal carbonate and free ammonia. But when properly made the present preparation is so uniformly satisfactory, and the additional stimulant effect of the small quantity of free ammonia so unobjectionable, that it would probably be unwise to modify the formula. The author prepared four samples of the aromatic spirit from different samples of commercial carbonate, three of them with 90 Cc. of ammonia water (10 per cent.), the fourth with 32 Cc. of stronger ammonia water (unassayed). Ten Cc. of the resulting spirit should require 10 Cc. of $\frac{N}{1}$ $H_2SO_4$ solution. The first three samples required respectively 10, 9.8 and 9.6 Cc., this being an average of 9.8 Cc.; the fourth sample required only 9.0 Cc. $\frac{N}{1}$ $H_2SO_4$ solution. The carbonic dioxide was eliminated by a practical test similar to the one official in the B. P., which was carried out as follows: Into a series of large test-tubes, numbered consecutively from 1 to 5, or higher if necessary, introduce carefully measured volumes of the aromatic spirit of ammonia; in No. 1 place one-tenth (.1) of a cubic centimeter, in No. 2 place two-tenths (.2) of a cubic centimeter, and so continue, increasing one-tenth with each successive tube. To each tube one-half (.5) cubic centimeter of barium chloride test solution, U. S. Pharmacopœia, is added, the tube nearly filled with distilled water and then shaken thoroughly. The contents of No. 1 are filtered and an additional drop of barium chloride, T. S., added; should there be no cloudiness, proceed with each successive tube until a distinct cloudiness shows an excess of carbonate which 5 Cc. of the test solution is insufficient to precipitate. In the case of the first three samples the average quantity of aromatic spirit required for the complete precipitation of .5 Cc. of barium chloride, T. S., was .4 Cc.; * in the fourth sample a much lower result was noted. The milkiness, which occurs when the spirit is mixed with water, is well known, and at first sight might appear to interfere with this test, but if the mixture be sufficiently diluted the filtrate is absolutely clear in every instance.—Proc. Ky. Pharm. Assoc., 1902, 86–88.

*Aromatic Spirit of Ammonia — Cause of Precipitation, &c.*— In the course of a critical review of the chemistry involved in the different preparations of the U. S. P., Bernhard O. Leubner has the following to say concerning the cause of precipitation in aromatic spirit of ammonia: When the aqueous solution of ammonium carbonate is mixed with the alcohol containing the oils of lemon, lavender and nutmeg, a precipitate may deposit, hence the directions to set the liquid aside during 24 hours before filtering. The precipitation often occurs at a much later period and may be ascribed to the following:

* In conformity with Mr. Curry's observations the official requirement for alkalinity and carbon dioxide might properly be as follows: 10 Cc. should require not less than 9.5 Cc. of $\frac{N}{1}$ $H_2SO_4$ solution for neutralization; not less than 7.5 Cc. of barium chloride T. S. for complete precipitation of carbon dioxide.—Rep.

1. The incomplete conversion of the official carbonate into the normal carbonate by the ammonia water. From 8 to 12 hours should be allowed before adding the alcohol.

2. If old and exposed ammonium carbonate is used, the amount of ammonia water in the official formula will be insufficient to convert all of the bicarbonate into the normal carbonate.

3. The soluble normal carbonate in the spirit may be converted into the bicarbonate, through the loss of ammonia.

Owing to the presence of alkali hydrate and carbonate, the spirit is incompatible with the various solutions of iron, mercury, and calcium; it precipitates alkaloids, effervesces with acids, and when mixed with aqueous liquids the volatile oils separate from the solution.—Merck's Rep., Aug., 1902, 303.

*Spirit of Nitrous Ether—Deficiency in Strength.*—A. G. Smith has subjected thirteen samples of spirit of nitrous ether to assay, and found that not a single one complied with the pharmacopœial standard, the percentage of ethyl nitrite, in the order of their strength, being as follows: 3.8, 3.4, 3.3, 2.65, 2.3, 2.3, 1.7, 1.4, 0.5, 0.3, 0.14, 0.0, 20.0 per cent. He furthermore finds that, contrary to the official requirements, spirit of nitrous ether is largely kept in clear glass bottles, partly full, and exposed to the light.—Proc. Mich. State Pharm. Assoc., 1902, 55.

*Spirit of Nitrous Ether—Preservation.*—Although not a new expedient, it is interesting to note that Prof. P. E. Hommell has found the presence of a crystal of potassium bicarbonate to preserve spirit of nitrous ether when kept in bulk. He, however, advises that it be made in small quantities, and kept in small, well-corked vials.—Proc. New Jersey Pharm. Assoc., 73.

*Spirit of Nitrous Ether—Preparation and Preservation.*—Bernhard O. Leubner, in view of the ease with which spirit of nitrous ether decomposes on keeping, proposes, as being most convenient, the "cold" process for the preparation of the concentrated ether. To a cold aqueous solution of sodium nitrite mixed with alcohol, diluted sulphuric acid is added drop by drop. The ethyl nitrite, which rises to the surface is decanted from the mixture and purified, as in the distillation process. To prevent the deterioration of the spirit, the concentrated ethyl nitrite, previously made anhydrous with dry potassium carbonate, should be diluted with official alcohol of full strength. It should be kept in small, strong and completely filled amber-colored (not blue or green) bottles, in a cool, dark place. The bottles may be stoppered with waxed glass stoppers and covered with dark paper. Pure ethyl nitrite is well preserved in strong alcohol, kept neutral by a crystal of potassium bicarbonate. The most permanent solution is probably that in absolute alcohol, containing about 5 per cent. of glycerin.—Merck's Report, Sept., 1902, 344.

*Bay Rum—Improved Manipulation.*—The following formula for bay rum, which does not differ materially from that given in the U. S. Pharmacopœia, furnishes a perfectly clear and sparkling product under the improved modification recommended: Dissolve 35 Cc. of oil of bay, 2.5 Cc. of oil of orange and 2 Cc. of oil of pimenta in 2000 Cc. of alcohol. Allow to stand for twenty-four hours, occasionally shaking, add 25 Gm. of magnesium carbonate mixed with 1,500 Cc. of water, shake occasionally for twenty-four hours and filter.—D. Apoth. Ztg., 1902, 491.

*Lavender Water—Formulas.*—The following formulas for "lavender waters" are designated as "valuable" in "Merck's Report" (July, 1902, 296):

| | | |
|---|---|---|
| No. 1. | Oil lavender | 4 fl. ozs. |
| | Cologne spirit | 6 pints. |
| No. 2. | Oil lavender | 4 ozs. |
| | Magnesium carbonate | 1 ozs. |
| | Rose water | 1 pint. |
| | Cologne spirit | 6 pints. |

Triturate the oil with magnesium carbonate, gradually adding the alcohol and water previously mixed, and filter.

| | | |
|---|---|---|
| No. 3. | Oil lavender | 10 fl. drs. |
| | Bergamot oil | 90 min. |
| | Neroli oil | 4 drops. |
| | Sandalwood oil | 7 drops. |
| | Oil rose geranium | 6 drops. |
| | Tincture of musk | 8 drops. |
| | Alcohol | 30 fl. ozs. |
| | Water | 30 fl. ozs. |

*Florida Water — Various Formulas.*—The following formulas for "Florida Water" are given in "Merck's Report" (Sept., 1902, 366):

| | | |
|---|---|---|
| No. 1. | Oil bergamot | 50 Cc. |
| | Oil lemon | 50 Cc. |
| | Oil lavender | 12 Cc. |
| | Oil cloves | 1.5 Cc. |
| | Oil cinnamon | 1.5 Cc. |
| | Oil neroli | 0.7 Cc. |
| | Musk | 0.2 Gm. |
| | Tincture of vanilla | 12 Cc. |
| | Tincture of benzoin | 12 Cc. |
| | Cologne spirit | 3000 Cc. |
| | Water | 500 Cc. |
| No. 2. | Oil lavender | 8 Cc. |
| | Oil bergamot | 8 Cc. |
| | Oil lemon | 8 Cc. |
| | Oil orange | 4 Cc. |

| | | | |
|---|---|---|---|
| | Oil neroli | 2 | Cc. |
| | Oil rose geranium | 2 | Cc. |
| | Essence of musk | 15 | Cc. |
| | Tincture of tonka (1.9) | 30 | Cc. |
| | Tincture of benzoin | 8 | Cc. |
| | Orange-flower water | 120 | Cc. |
| | Orris root | 15 | Gm. |
| | Alcohol to make | 950 | Cc. |
| No. 3. | Oil lavender | 60 | Cc. |
| | Oil lemon | 30 | Cc. |
| | Oil orange | 30 | Cc. |
| | Oil cloves | 20 | Cc. |
| | Deodorized alcohol to make | 4 | liters. |
| No. 4. | Oil bergamot | 90 | Cc. |
| | Oil lavender | 30 | Cc. |
| | Oil cloves | 5 | Cc. |
| | Oil cinnamon | 10 | Cc. |
| | Oil neroli | 4 | Cc. |
| | Oil lemon | 30 | Cc. |
| | Extract of jasmine | 180 | Cc. |
| | Rose water | 475 | Cc. |
| | Alcohol | 4 | liters. |
| | Tincture of storax | 60 | Cc. |

After mixing the ingredients the Florida water should be allowed to stand for a month, in order to permit the odors to blend thoroughly, and then be filtered.

*Flavoring Extracts—Standards.*—Prof. Wilbur L. Scoville interestingly discusses the subject of standards for flavoring extracts, from which the following may be desultorily quoted: Like most standards, those for flavoring extracts are a matter of choice and dependent on education. The epicure is one who has enjoyed the finest opportunities of culinary art, and by attention thereto has learned to appreciate them. The non-epicure may have lacked either the opportunity or the needed attention to train his palate to a fine discrimination, and there are many grades of them. Harmony more than quantity determines the pleasures of the table. Cooks are rarely artists, and if the seasoning of soups, meats and vegetables does not match that of the pastry, the latter, following, may appear flat or coarse, as the case may be. So the softness of the pastry-flavor is largely determined by the seasoning and quality of the more substantial food. This is, perhaps, the reason why a true

*Vanilla* flavor is so little appreciated. It follows after the coarser cuts of meat, or a habit of high seasoning, and the delicacy is mistaken for flatness or weakness of flavor. It is, therefore, not to be wondered that the heavier tonka is needed in part to make a satisfactory impression on the gustatory nerves. So vanilla extracts are made from vanilla beans of

various grades, from the delicate Mexican bean to the "pure" but coarse Tahiti beans or the rank "Vanillins." They are combined or not, according to demands, with tonka, vanillin or cumarin to suit the taste of buyers, and to suit the preference or taste of the consumer, and it is on this account that "Vanilla Extract" is supplied by manufacturers at prices varying from one to thirty dollars a gallon, and that agents are instructed to take orders at any desired price.

*Lemon Extracts* are more difficult of adjustment, because the available flavors of this class are more restricted, and the problem of making them soluble and at the same time possessing a good quality, is greater. They differ mainly in the quality and character of the oils from which they are made, the best being made by direct extraction of the fruit, or from selected oil, and all other grades according to selection—from "concentrated" or "soluble," or "terpeneless" oils, which vary widely and need to be toned down with lemon peel. And while "citral" is the chief, it is not the sole, flavoring principle, its coarseness of flavor, particularly in the cheaper grades, is not easily covered.

*Orange Extracts* correspond to lemon in composition and qualities, and are quite as inconsistent. In short, the only standard that can be legally applied to flavoring extracts is that of wholesomeness. The delicacy, the correctness of the flavor, and the other qualifications must remain with the desires of the individual. Formulas designated as "standard" may therefore be misleading or detrimental to the man in business.—Amer. Journ. Pharm., April, 1903, 151–155.

STILI.

*Pencils of Alum and Copper—Preparation.*—Practical methods for preparing pencils of alum, of sulphate of copper, and of a combination of the two, are given by a writer in "Pharmaceutische Zeitung" (1903, 175), as follows:

*Alum Pencils.*—Add a few drops of water to powdered alum in a porcelain dish, heat until melted over an alcohol or gas flame, and pour into previously-shaped molds of paraffin paper.

*Alum and Sulphate of Copper Pencils* may be prepared by treating a powdered mixture of the two salts in the same way, but

*Sulphate of Copper Pencils* are recommended to be made by triturating finely-powdered copper sulphate with sufficient mucilage of acacia to produce a plastic mass, forming this mass by hand into the desired shape (pencils or "points") and allowing to harden for several days.—Amer. Journ. Pharm., June, 1903, 290.

SUPPOSITORIA.

*Suppositories—Manipulation by the Cold Process.*—Prof. L. V. Haven-

hill and Prof. E. L. Sayre in a paper describing various pharmaceutical manipulations for "freshmen," give the following practical direction for manipulating when making suppositories by the cold process: First incorporate in a mortar the required amount of medicinal material (previously brought to the proper conditions if necessary) with a small portion of the cacao butter which should be either grated or in the form of thin shavings. The nucleus is next mixed with the remaining portion of the base, which should be added in portions until the whole is of uniform composition. This mass is next transferred to the center of a square piece of cloth, preferably heavy bleached muslin, and there gradually kneaded and warmed by the hand until at last it is worked into a cylinder of the necessary diameter and length. The cylinder is next transferred to a pill tile and smoothed with the spatula and finally cut into the required number of pieces. These pieces are then returned to the cloth and pointed or otherwise shaped, and finally finished upon the pill tile with the spatula. At no time is it desirable to touch the suppository with the naked fingers. In warm weather it is frequently necessary to reduce the temperature with a little ice.—Merck's Rep., July, 1902, 262.

Referring to the above suggestion, and believing in the idea of not touching the suppository with the naked fingers, Hans Habersack suggests, instead of using bleached muslin, to use ordinary filtering paper. The mass, made by incorporating the medicinal substance with the requisite quantity of cacao fat, to which a small quantity of lard or castor oil has been added, can be worked with folded sheets of filtering paper to a cylinder of the required diameter and length, then cut into the required number of pieces, and finished on the pill tile with the spatula. A little practice will prove this method very handy and easy.—Merck's Rep., Sept., 1902, 346.

*Suppositories—Manipulation by the Cold Method.*—J. T. Pepper makes some practical remarks on suppository-making, expressing his preference to hand manipulation by the cold method for ordinary dispensing purposes. With a warm Wedgewood mortar and pestle of the proper size, a graduated porcelain slab, a couple of good spatulas, the medicaments, some best qualities cacao butter, a good dusting powder, such as starch or lycopodium, an expert dispenser who knows just what to do and when and how to do it, will take only a few minutes to prepare a dozen suppositories. The cacao butter should be shaved or grated finely into the mortar, previously warmed, and triturated thoroughly with the medicaments, so that they will be evenly distributed throughout the mass. The mortar and pestle should not be so warm as to melt the cacao butter, but only just warm enough to cause it to soften. Remove the mass from the mortar to the slab, and, after dusting the hands with powder, work the mass quickly into good condition and partially roll it into shape; continue the rolling until the mass is perfectly smooth and even throughout its entire length on the

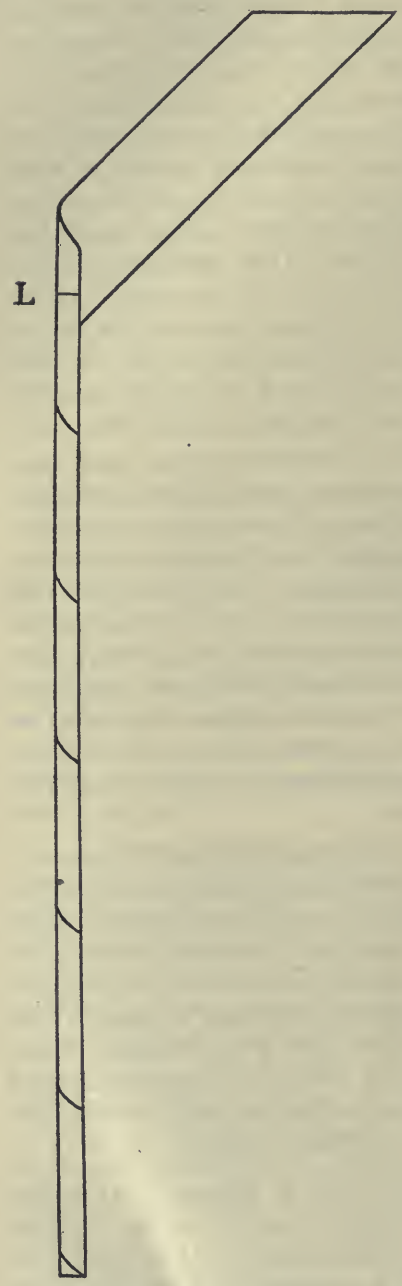
porcelain slab first with the hand and finally with the spatula. When the mass is rolled out to the required length, place it along the graduated marks on the porcelain slab and divide with the spatula into as many equal parts as are required, and form with the fingers and spatula into conical suppositories. A dispenser will become very expert at this work with practice, and can deliver the finished suppository almost as smooth and well-shaped as those made in moulds. Quickness and certainty of action are two very important factors, a false move causing loss of time, and all the work must be done quickly, just when the mass is in the proper temperature for manipulation. The temperature of the dispenser's hands is another point to be considered. Some men are so much "warmer blooded" than others that the cacao butter melts very quickly in their hands, and they are hardly able to make suppositories in this way at all. All such individuals can do is to use an abundance of the dusting powder and work a little more quickly.—Pharm. Era, Aug. 14, 1902, 168.

*Hand Made Cacao-Butter Suppositories—Preference Over Other Methods.*—Disclaiming novelty in the suggestion to make suppositories by hand without the aid of heat, W. F. Root emphasizes and explains the practical reasons for his preference. The convenient and popular weight of the rectal cacao-butter suppository is twenty grains. The grated fat having been incorporated with the prescribed amount of drug in a mortar, division may be, at the discretion of the operator, either on the pill slab or by weighing. The divided portions are then easily rolled and shaped with the aid of a spatula and the fingers. The time employed is no longer nor the labor greater than in the execution of a batch of pills. The results are such as should appeal to every thoughtful dispenser.—West. Drug., Feb., 1903, 64; from Proc. Ver. Pharm. Assoc.

*Suppositories—Cold Process for Incorporating Vegetable Extracts.*—Meistermann employs a basis of powdered acacia, grated cacao butter and water for dispensing vegetable extracts, such as those of krameria or opium, in form of suppositories. For every nine parts of the completed mass, he uses one part of powdered gum and three parts of cacao-butter with sufficient water to mass. The active ingredients are first intimately mixed with the powdered gum, the grated cacao butter is then worked in water, being added just as in making a pill mass. When the desired consistence has been attained, the mass is rolled out, divided and shaped by hand into cones.—Pharm. Journ., July 26, 1902, 83; from Repertoire, *58*, 202.

*Urethral Rods—An Economical Mold.*—Ed. E. Williams calls attention to the utility of the so-called "paper straws," such as are in use at all soda fountains, as a convenient and economical mould for forming urethral rods. These "straws" unroll readily in the manner shown by the accompanying illustration, Fig. 33, and are used as follows: Having selected the requisite number of "straws," the end from which they unroll is kept

FIG. 33.




Mold for Urethral Rods.

uppermost, and a mark is made at a point corresponding to the desired length, as shown at "L." The mixture of cacao fat and medicinal ingredients, for instance, bismuth subgallate, kept in a molten condition and well stirred, is then drawn by suction to the line "L," and the molten material is retained by folding over the ends about an eighth of an inch, and dropped into ice water, where they are chilled, and may then be unrolled in less time than ordinary molds require for chilling.—Amer. Drug., Aug. 11, 1902, 69.

*Syrup of Hydriodic Acid—Preparation from a Concentrated Solution.*—Ferdinand A. Sieker prepares a 16 per cent. solution of hydriodic acid, which is stable and serves a convenient purpose for preparing the official syrup, as follows: Dissolve 273 Gm. potassium iodide and 21 Gm. of potassium hypophosphite in 315 Cc. of distilled water by heating it to boiling. Also dissolve 294 Gm. of crystallized tartaric acid in 420 Cc. of water by heating it to boiling. Then pour the hot solution of potassium iodide into the hot solution of tartaric acid and set aside in a well closed container to cool. When cool chill the solution to about +5° C. with ice and keep it at this temperature for some time. Then filter through a plug of absorbent cotton contained in the neck of a glass funnel. A syrup of hydriodic acid of the U. S. P. strength, volume for volume, can be prepared from this solution by diluting 1 volume with 15 volumes of simple syrup.—Pharm. Rev., Nov., 1902, 518–520.

*Syrupus Calcis Lactophosphatis, B. P.—Improved Manipulation.*—J. P. Gilmour observes that it is an improvement in manipulation, when preparing syrup of calcium lactophosphate, to rub up the creta precipitata with half the quantity of water ordered for the dilution of the lactic acid. Add this milk to the diluted acid in the receiver of a percolator, or other similar wide-mouthed vessel, shaking after each addition, until a clear solution is obtained. If the official directions are observed the calcium lactate with a core of undecomposed carbonate floats in lumps on the surface of the dilute acid, and takes much longer to dissolve. The sugar, which for this and most B. P. syrups ought to be of the cut-loaf variety, is best dissolved by percolation.—Pharm. Journ., Jan. 24, 1903, 96.

*Syrup of Calcium Lactophosphate, B. P.—Improved Formulæ.*—Harold Deane, after a critical review of the B. P., U. S. P., and Belgian formulas for syrup of calcium lactophosphate, finds the cause of precipitation in this syrup to be deficiency in the amount of phosphoric acid, and recommends the following modified formula and manipulation:

| | |
|---|---|
| Precipitated calcium carbonate | 25 grammes. |
| Concentrated phosphoric acid | 50 cubic centimetres. |
| Lactic acid | 60 cubic centimetres. |
| Refined sugar | 700 grammes. |
| Orange-flower water of commerce (undiluted) | 25 cubic centimetres. |
| Distilled water, a sufficient quantity. | |

Add the precipitated calcium carbonate gradually to the concentrated phosphoric acid and the lactic acid, mixed, and diluted with 250 Cc. of distilled water. When solution is complete, add the undiluted orange flower water, filter and wash the filter with 100 Cc. of distilled water. Dissolve the refined sugar in the mixture without the aid of heat; add sufficient distilled water to make one thousand cubic centimetres of the syrup. A sample made according to this formula has been kept in an ordinary well-lighted room for six months without showing appreciable change.—Pharm. Journ., Jan. 31, 1903, 127.

*Syrupus Codeinæ Phosphatis, B. P.—Improved manipulation.*—J. P. Gilmour observes that instead of increasing the quantity of water officially directed in order to dissolve the codeine phosphate when preparing the B. P. syrup of codeine phosphate, as recommended by Squire, it suffices to warm the official quantity of water, with which solution is readily effected. The solution being then at once added to the syrup, there is no chance for the salt again separating.—Pharm. Journ., Jan. 24, 1903, 96.

*Syrup of Ferrous Iodide—Manipulation.*—A. Schleimer contributes the following method and manipulation for preparing syrup of ferrous iodide, which his experience proves to be satisfactory: First wash the card teeth with dilute acid to remove any alkali, then rinse thoroughly in distilled water, cover the iron with 75 per cent. of the water to be used, and then add the

iodine. Let this stand for 24 hours, rotating the mixture every hour or so, using a Florence flask stoppered with cotton. After 24 hours filter the solution into a glass-stoppered bottle, and add the rest of the water, after using it to rinse the excess of iron in the flask, to the filter. Add to this the required weight of rock candy instead of sugar, and allow to dissolve. This gives a permanent, full strength syrup, answering every requirement of the U. S. P.—Merck's Rep., June, 1903, 158.

*Syrup of Ferrous Iodide—Prevention of Change and Restoration.*—Prof. E. V. Howell briefly reviews the suggestions that have been made from time to time, with the object of securing stable liquid preparation of ferrous iodide, or restoring such as have undergone change since Frederking, of Riga, published a formula for this purpose in Buchner's Repertorium in 1839. There are few syrups that have given so much trouble to pharmacists, or have caused so much discussion, yet very little that is entirely new has been brought out in any recent article. Summing up the expedients that have been suggested (1) to prevent change and (2) to restore the color of syrup of ferrous iodide after change, these are briefly the following:

*For Prevention—*

1. Small bottle, tightly corked, well filled.
2. White glass bottles.
3. Keep in light.
4. Glycerin.
5. Saccharine matter as glucose, rock candy syrup, etc.
6. Tartaric or citric acid.
7. Hypophosphorous or dilute hypophosphorous acid.

*To Restore Color—*

1. Direct sunlight.
2. Sodium hyposulphite.
3. Percolation through animal charcoal for caramelization.
4. Boiling with iron wire.

The author found reduced iron to remove color from the discolored syrup by shaking *without* heat, the objection to heat being that, although the red color is removed, a pale color remains—not the original pale green; but in either case the syrup appears to keep subsequently without again changing on exposure to air. He recommends the improved formula of Hynson and Dunning, in which 5 Cc. of 50 per cent. solution of hypophosphorous acid added in making 1,000 Gm. of the syrup.—Proc. N. C. Pharm. Assoc., 1902, 62.

*Syrup of Ferrous Iodide—Superiority of Hypophosphorous Acid Over Other Preservatives.*—Harry Matusow reviews the various expedients that have been recommended from time to time for the preservation of syrup of ferrous iodide, and concludes that hypophosphorous acid seems to be the only substance to hold undisputed ground as an effective preservative

of this syrup. Of all the methods and means that have been suggested as preservative of syrup of ferrous iodide, with the single exception of hypophosphorous acid, while they have proven successful in the hands of some, they have absolutely failed in the hands of others.—Amer. Journ. Pharm., Feb., 1903, 71–77.

*Syrup of Ferrous Oxide—Assay of Commercial Sample.*—A. L. Randall examined ten samples of syrup of ferrous iodide, which, according to the U. S. Pharmacopœia, should contain 10 per cent. of the salt, and found over half of them to contain within one per cent. of the official quantity. Four of them contained from 6.3 to 8 per cent. Proc. Mich. State Pharm. Assoc., 1902, 55.

*Official Syrups Containing Hypohhosphites—Criticism.*—Bernhard O. Leuber critically revises the faults of the different U. S. P. syrups containing hypophosphites. Regarding the

*Syrup of Hypophosphites*, the use of pure salts is of first importance. If the aqueous solution of the mixed hypophosphites leaves a deposit insoluble in the hypophosphorous acid, this should be filtered off. An increase in the amount of both sugar and hypophosphorous acid, or the addition of a little citric acid, is to be recommended, and pure sugar, free from ultramarine, is essential. In the case of the

*Comp. Syrup of Hypophosphites, N. F.*, it is recommended that the ferric hypophosphite, *freshly prepared*, be used, as in the liquor ferri hypophosphitis, N, F.—Merck's Rep., Aug., 1902, 302.

*Compound Syrup of Hypophosphites, N. F.—Modification of Formulas.*—A. E. Hiss, in the course of critical observations on a number of U. S. P. and N. F. syrups, mentions that both the "clear" and "cloudy" formulas for compound syrup of hypophosphites, N. F., have proven unsatisfactory in his hands, but that he has found the following formulas and manipulations to yield satisfactory preparations:

1. The clear syrup is prepared as follows:

| | | |
|---|---|---|
| Calcium hypophosphite | 148 | gr. |
| Potassium hypophosphite | 96 | gr. |
| Manganese hypophosphite | 64 | gr. |
| Quinine alkaloid | 28 | gr. |
| Strychnine alkaloid | 4 | gr. |
| Ferrous sulphate | 120 | gr. |
| Hypophosphorous acid, 50 per cent | 2 | fl. dr. |
| Diluted phosphoric acid | 5½ | fl. dr. |
| Sugar | 3 | av. lb. |
| Distilled water, enough to make | ½ | gal. |

Dissolve the potassium and manganese hypophosphites with 64 grains of the calcium hypophosphite in 26 fluid ounces of the water. Dissolve the quinine and strychnine in 2 fluid ounces of the water with the aid of

the hypophosphorous acid. Mix the two solutions and in the mixture dissolve the sugar by agitation. Dissolve the ferrous sulphate, which should be a C. P. article in clear, green crystals, in 1½ fluid ounces of distilled water and to this add the diluted phosphoric acid. Rub 84 grains of the calcium hypophosphite in a mortar to fine powder and add the iron solution. Triturate together for a minute or so, then filter, and add enough distilled water through the filter to make the liquid measure 8 fluid ounces. Mix this liquid with the syrupy solution previously prepared, add enough simple syrup, if necessary, to make the liquid measure one-half gallon, and filter the whole through paper. The resulting syrup is clear, bright, colorless, with a slight, blue fluorescence of a pleasantly acidulous and bitter taste, and it is permanent unless exposed to the light when like preparations containing iron hypophosphite it will become darker.

2. The cloudy syrup is prepared as follows:

| | | |
|---|---|---|
| Calcium hypophosphite | 128 | gr. |
| Sodium hypophosphite | 64 | gr. |
| Potassium hypophosphite | 64 | gr. |
| Quinine sulphate | 40 | gr. |
| Iron pyrophosphate, scale | 96 | gr. |
| Strychnine sulphate | 6 | gr. |
| Sugar | 3½ | av. lb. |
| Water | 32 | fl. oz. |
| Simple syrup, enough to make | ½ | gal. |

Mix the three hypophosphites, quinine sulphate and water in a suitable dish, apply a gentle heat until all are dissolved, add the sugar, continue the heat until it is dissolved, then bring the liquid to a boil, remove the vessel from the source of heat, add the iron pyrophosphate, stir the liquid until it is dissolved, dissolve the strychnine sulphate in about 6 fluid drachms of distilled water, add to the preceding solution, strain the whole through cloth, and add enough simple syrup, if necessary, to make the liquid measure one-half gallon. This makes a thick syrup in which the cloudy matter subsides slowly and is readily diffused through the liquid on agitation. It should be preserved from the light as it becomes darker on exposure.—West. Drug., Aug., 1902, 425.

*Syrupus Hypophosph. Co., B. P. C.—Improved Manipulation.*—H. John Henderson calls attention to the turbidity of the Compound Syrup of Hypophosphites when made in accordance with the directions of the B. P. C. Formulary. A clear preparation may be obtained efficiently and rapidly if a concentrated solution of the hypophosphites is made of such strength that it simply requires the addition of three times its volume of simple syrup for completion. The resultant syrup, though not quite bright, contains a negligible quantity of precipitate; but a perfectly bright syrup may be obtained, as suggested in Squire's "Companion to the Pharmacopœia," if 1,033 grains of potassium citrate are substituted for

the 800 grains of citric acid ordered in the preparation of the "liquor ferri hypophosph. fort.," and omitting the solution of ammonia.—Pharm. Journ., Nov. 29, 1902, 552.

*Syrup of Tolu—Variation in Reaction According to Process of Preparation.*—A. Astrue and J. Cambe have examined syrup of balsam of tolu prepared by three methods in vogue on the continent of Europe; that prepared according to the Codex (digestion of the balsam with water); that obtained by the precipitation of tincture of tolu balsam with syrup; and a third form, prepared by mixing a distillate of tolu balsam with simple syrup; and they find that these syrups behave differently towards reagents. The syrup, prepared according to the official directions, alone liberates iodine from a solution of potassium iodide in sufficient quantity to give a yellow tint to the mixture, or a blue reaction with starch. The other two varieties of syrup are without action on potassium iodide solution. Alkalies give a greenish-yellow with both the official syrup, and that prepared from tincture, which disappears on the addition of an acid. The syrup prepared from the distillate gives no such color. It is, therefore, possible, by means of these tests, to differentiate between the official syrup and those prepared by the above indicated extemporaneous methods. —Pharm. Journ., May 23, 1903, 700; from Journ. Pharm. Chim. [6], *17*, 367.

*Compound Syrup of Benzosol—Formula.*—Frederick E. Niece recommends the following formula for preparing an acceptable preparation for the convenient administration of benzosol:

| | |
|---|---|
| Benzosol (powdered) | 32 grains. |
| Tincture of tolu | 1 drachm. |
| Glycerin | 6 drachms. |
| Syrup acacia, enough to make | 2 ounces. |

Mix the tincture with the glycerin, add the benzosol by agitation, then the syrup, and vigorously agitate to a homogeneous mixture. Each teaspoonful contains 2 grains of benzosol. This is recommended in such cases where pills, powders, capsules or tablets are intolerable.—Pharm. Era, Febr. 12, 1903, 170.

*Cough Syrups—Formulas Suitable for Infants and Children.*—A. E. Hiss recommends the following formulas for "cough syrups" which are suitable for infants and children:

| | | |
|---|---|---|
| No. 1. | Syrup of squill | 8 fl. ozs. |
| | Fluid extract of ipecac | 4 fl. drs. |
| | Paregoric | 4 fl. ozs. |
| | Chloroform | 2 fl. drs. |
| | Anisated solution of ammonia | 1 fl. oz. |
| | Simple syrup to make | 4 pints. |

| | | |
|---|---|---|
| No. 2. | Chloral hydrate | 2 drs. |
| | Ammonium chloride | 4 drs. |
| | Ammonium bromide | 1 oz. |
| | Water | 8 fl. ozs. |
| | Syrup of ipecac | 3 fl. ozs. |
| | Hive syrup | 4 fl. ozs. |
| | Syrup of wild cherry | 24 fl. ozs. |
| | Syrup of licorice | to make 4 pints. |

Dissolve the solids in the water, and add the other ingredients.—Merck's Rep., April, 1903, 97.

*Cough Syrups—Competition Prize Formulas.*—The Tennessee State Druggists' Association having offered a prize for the best formulas for various pharmaceutical preparations, the following formulas for cough syrups were presented:

(1) A. B. Bains proposes: Codeine, 100 grs.; benzoic acid, 2 dr.; chloroform, 5 dr.; oil of peppermint, 1 dr.; fl. ext. ipecac, 6½ dr.; fl. ext. tolu (soluble), N. F., 3 ozs.; fl. ext. licorice, 1½ oz.; fl. ext. wild cherry, 2½ ozs., glycerin, 2 ozs.; tar water, saturated, 15 ozs.; alcohol, 20 ozs.; dist. water, 2½ pts.; sugar, 4 lbs.; caramel, q. s. Dissolve the benzoic acid and oil in the alcohol, and mix with the other ingredients, except the sugar, chloroform, and codeine; allow to stand 24 hours and filter; dissolve the codeine and chloroform in the filtrate, and pass this through the sugar contained in a percolator, followed by enough water to make one gallon.

(2) B. B. Kerr proposes: Ground horehound, 5 ozs.; ground mullein, 5 ozs.; ground wild cherry, 2 ozs.; ground comfrey, 2 ozs.; ground lobelia, 2½ ozs.; wine of tar, 2½ pt.; whiskey, 2½ pt.; glycerin, 10 ozs.: sugar, 12 lbs.; water, enough to make 2 gallons.

(3) J. Goldbaum proposes: Fl. ext. opium camph., 2½ lbs.; fl. ext. squills co., 5 lbs.; fl. ext. mullein, 4 lbs.; alcohol, 2 lbs.; muriate of ammonia, 5 lbs.; water, 15 lbs.; honey, 50 lbs.—Proc. Tenn. State Drug. Assoc., 1902, 49, 51 and 54.

*White Pine Cough Syrup—Improved Formula.*—H. P. Pettigrew finds that although the formula for "white pine cough syrup" of the N. F. is quite satisfactory for general use, the following formula gives a more satisfactory preparation:

| | |
|---|---|
| White pine bark | 5 ozs., 370 grs. |
| Balm gilead buds | 4½ ozs. |
| Spikenard root | 4½ ozs. |
| Wild cherry bark | 4 ozs., 90 grs. |
| Ipecac root | 256 grs. |
| Nitrate of sanguinarine (Merrell) | 16 grs. |
| Acetate morphine | 64 grs. |
| Chloride ammonium | 512 grs. |
| Chloroform | 512 m. |
| Sugar | 6 lbs. |
| Alcohol and water of each sufficient to make | 1 gal. |

Mix alcohol, one part, with water, three parts. Percolate the drugs in the usual way, collecting four pints of percolate. Dissolve the sugar in the percolate by agitation. Then add the chemical salts, dissolved separately in hot water. Finally add the chloroform and mix thoroughly by shaking violently, or, if desired, the chloroform may first be emulsified with about four ounces mucilage acacia, then added to the syrup together with sufficient caramel to darken it.

*Another Cough Cure* is recommended by the author to be prepared by the following formula:

| | |
|---|---|
| Fl. ext. cannabis indica | 2 fl. ozs. |
| Fl. ext. lobelia herb | 2 fl. ozs. |
| Acetate morphine | 32 grs. |
| Tartar emetic | 32 grs. |
| Chloroform | 480 min. |
| Essence spearmint | 80 min. |
| Essence cinnamon | 80 min. |
| Syrup tolu | 64 fl. ozs. |
| Syrupy glucose, q. s. to make | 1 gal. |

Add the chloroform to the syrup tolu, mix well; then add the fluid extracts, then the chemicals dissolved separately in hot water, finally the essences and glucose; mix thoroughly by agitation—West. Drug., Feb., 1903, 61.

*Soda Water Syrups—Practical Formulas.*—The following formulas for syrups that are useful at the soda fountains are given in "Merck's Report" (July, 1902, 296):

*Banana Syrup.*—Peel and slice very thin some sound, ripe fruit. Dip these slices, both sides, in granulated sugar and throw them in a conical cheese-cloth bag suspended over a jar. Allow the clear syrup to drain from the fruit without pressure, which will take five or six hours. The yield will be about two ounces heavy syrup for each four ounces of fruit used. For the fountain dilute this with three parts of plain syrup. Banana syrup so made is exceedingly good.

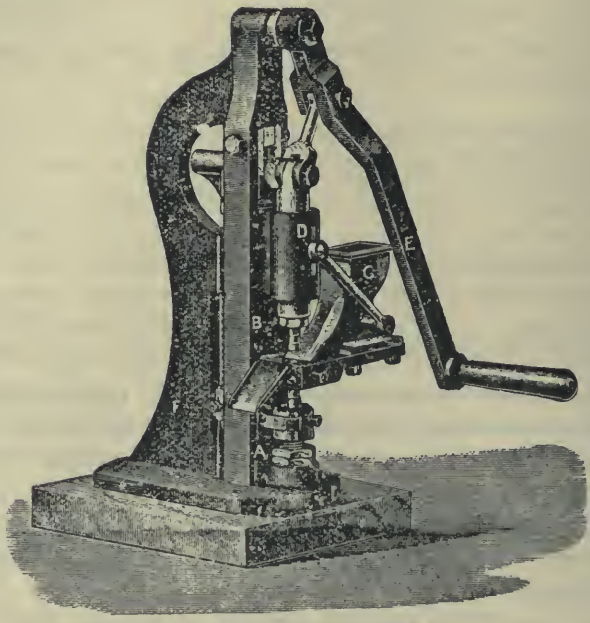
*Fruitina.*—Half an ounce of pineapple syrup, teaspoonful of lemon juice, one of raspberry vinegar; fill glass two-thirds full of fine cracked ice, put a mixing spoon in glass, and turn on the coarse stream of soda. Stir with spoon after having filled the glass within about one-fourth of the top with plain soda, then add more fine ice, heaping it on top of the glass; then on top of all put a teaspoonful of crushed raspberry and stick a small slice of orange between ice and glass. Serve with straws in ordinary thin soda glasses.

TABELLÆ.

*Tablet Machine—Simple Form for Hand Work.*—A tablet machine to work by hand with rapidity and force equal to that of a power machine has

been perfected by Mr. Buckley, of Allen and Hanbury's (London). It is shown by Fig. 34, and described as follows: *B* is the top punch which moves in the socket *D*, the top being shown by the lever-handle *E*. All that one has to do to make tablets is to put powder in the hopper *C*, and move the handle *E* back and forward; a pull forward makes

FIG. 34.




Tablet Machine.

one tablet, and a push back another. The degree of compression is independent of the force applied to the handle, for if a person of greater strength than another works it, he simply makes more tablets than the other in a given time—that is how his extra force is expended. The weight of the tablet is arranged by fixing the bottom punch *A*, so as to give a hole that will hold exactly the amount of the loose powder desired, and the degree of compression is regulated by adjusting the top plunger *B*, so that it will give a thin or thick tablet; punches of various diameters are of course supplied. The hopper *C* is actuated by the lever attached to the plunger *B* moving in *D;* when the powder is compressed the bottom punch *A* pushes up the tablet, the nose of *C* pushes it off, and as *C* goes back it fills the hole over *A*. And so the operation proceeds, the back movement being as productive of tablets as the forward one, so that half the time is not lost, as is usually the case with hand-machines. The machine enables the pharmacist to conveniently compress one or more tablets for a prescription, or to compress them by

the thousand for stock. In practice it has been shown that it is quite possible to compress one hundred tablets in twenty seconds by the watch.—Drug. and Chem., Nov. 1, 1902, 751.

*Tablets—Practical Hints.*—P. C. Gray makes some observations on the subject of tablet-making, which, while adding little to what has already appeared in the literature, give some practical hints that are profitably remembered. Tablets are becoming to be universally used, and have evidently come to stay, no matter what arguments may be brought against them by the pharmacist. The author, therefore, advises that pharmacists equip themselves so as to be prepared to make them either for stock or for demand in prescription work. The proper selection of material and menstruum can be acquired only by experience. Regarding the menstruum selected for making them, the author observes that it should possess a slight solvent action upon one or more of the ingredients, but the latter should not be too freely soluble, since the mass is then moulded with difficulty and the tablets are likely to be uneven. Sometimes they crack and are very hard. It should possess sufficient solvent action to make a firm yet not too hard a tablet, one that will hold firmly together when shaken in a vial, and which should readily disintegrate upon the addition of water. For tablets composed almost entirely of milk-sugar, a menstruum of three volumes of alcohol and one volume of water is preferable. For bodies insoluble in alcohol the proportion of water is raised in proportion to the increase of the active ingredient. In the case of fluid extracts and tinctures, thorough trituration with the sugar of milk is generally sufficient to produce a homogeneous mass for drying. Solid extracts produce more difficulty. If water is to be used for the diluent, not more than the absolute amount required should be used, since any excess will cause the mass to form lumps or cakes, and render the subsequent drying difficult. After the mass is dried it must be powdered before being moulded. Water is not good to make up the mass of extracts, as it will make it too sticky. Alcohol alone is not adapted to this, as the aqueous extracts abstract the water from alcohol. The best menstruum for extracts is three volumes of alcohol and one volume of chloroform. Tablets should not be left in mould over ten minutes, because if they are allowed to dry in the mould they cannot be pressed from it without crumbling. The sooner they are gotten out of the mould the better, as the tablets will dry more evenly and are smoother.—Proc. N. Carol. Phar. Assoc., 1902, 54.

*Compressed Tablets—General Method of Dispensing.*—Edmund White and R. A. Robinson, after mentioning some of the difficulties encountered in preparing compressed tablets at the dispensing counter, recommend the following as an efficient method: Melt one part of oil of theobroma, and add three parts of starch in powder. Stir thoroughly while continuing the application of heat, and when uniformly mixed allow to cool. This mixture constitutes the general excipient. For the production of tablets

add this excipient to the material to be compressed, so that the mixture contains from 5 to 10 per cent. of oil of theobroma. The oil imparts a somewhat granular character to the mixture, sufficient to enable it to flow easily and uniformly into the mould, and comparatively light pressure produces a tablet which may be dropped without fracture, and at the same time may be crushed to powder between the fingers or disintegrated rapidly in water at body temperature. While this method may not be so good as granulation for the manufacturer, it enables one to dispense tablets from a prescription with the ease and simplicity of dispensing pills. By this method the time and trouble involved in damping, sifting, and drying, incidental to the method of granulation, are entirely avoided, and lubrication of the moulds and dies during compression is, in our experience, unnecessary. Similar results may be obtained by using paraffin wax in place of oil of theobroma, but the latter appears to be more satisfactory, probably owing to its lower melting point. The mixture of medicament with the starch-theobroma excipient should be quite cold before beginning the compression, otherwise it has a tendency to adhere to the parts of the machine. As a general rule, 4 grains of material require 1 grain of the excipient, but if much sugar be present rather more must be added.—Trans. Brit. Pharm. Conf., 1902, 419, 420.

*Tabellæ Santonini Compositæ—Hospital Formula.*—The following formula is given in the Pharmacopœia (Ed., 1902) of St. Thomas' Hospital (London): Santonin, 1 grain; mercurous chloride, 1 grain; chocolate powder, 2 grains. Lightly compressed. They should be disintegrated in in the mouth, or crushed and given as powder.—Pharm. Journ., Nov. 15, 1902, 501.

*Perfume Tablets—Various Formulas.*—The following formulas for "perfume" tablets are designated as valuable in "Merck's Report" (Sept., 1902, 366):

| | | | |
|---|---|---|---|
| No. 1. | Oil lavender | 2 | fl. drs. |
| | Oil bergamot | 2 | fl. drs. |
| | Oil clove | 1 | fl. dr. |
| | Oil rose geranium | 30 | min. |
| | Vanillin | 8 | grs. |
| | Expressed oil almond | 1 | fl. dr. |
| | Paraffin | 4 | ozs. |

Triturate the vanillin with the almond oil, melt the paraffin and when nearly cold add the mixture and the other oils, stirring until ready to set.

| | | | |
|---|---|---|---|
| No. 2. | Oil lignaloes | 2 | fl. drs. |
| | Heliotropin | 30 | grs. |
| | Oil bergamot | 30 | min. |
| | Oil lemon | 30 | min. |
| | Expressed oil almond | 1 | fl. dr. |
| | Paraffin | 4 | ozs. |

| | | | |
|---|---|---|---|
| No. 3. | Oil ylang ylang | 2 | fl. drs. |
| | Oil clove | 1 | fl. dr. |
| | Oil sandalwood | 30 | min. |
| | Coumarin | 20 | grs. |
| | Expressed oil almond | 1 | fl. dr. |
| | Paraffin | 4 | ozs. |

In the same number of the journal quoted the following formulas for *Aromatic Cachous* are given:

| | | | |
|---|---|---|---|
| No. 1. | Extract licorice | 3 | ozs. |
| | Powdered catechu | 1 | oz. |
| | Powdered sugar | 1 | oz. |
| | Powdered tragacanth | 4 | drs. |
| | Oil cloves | 1 | fl. dr. |
| | Oil cassia | ½ | fl. dr. |
| | Oil nutmeg | 12 | drops. |
| | Tincture ambergris. | | |

Mix and beat the mixture to a firm, uniform mass, with rose- or orange-flower water, and form into 1-gr. or 2-gr. pills or square tablets, and when dry, coat with silver.

| | | | |
|---|---|---|---|
| No. 2. | Oil peppermint | 30 | drops. |
| | Oil lemon | 20 | drops. |
| | Oil neroli | 20 | drops. |
| | Oil cinnamon | 20 | drops. |
| | Cloves | 40 | grs. |
| | Cardamom | 80 | grs. |
| | Vanilla | 120 | grs. |
| | Orris root | 150 | grs. |
| | Mace | 400 | grs. |
| | Sugar | 300 | grs. |
| | Extract licorice | 1¼ | ozs. |
| | Mucilage acacia, sufficient. | | |

Reduce the solids to powder, add the remaining ingredients, make into a mass, roll out flat, and cut into pieces of suitable size.

| | | | |
|---|---|---|---|
| No. 3. | Nutmeg | 192 | grs. |
| | Cardamom | 140 | grs. |
| | Vanilla | 4 | drs. |
| | Cloves | 64 | grs. |
| | Orris | 256 | grs. |
| | Musk | 1 | gr. |
| | Oil peppermint | 1 | fl. dr. |

## TINCTURÆ.

*Tinctures—Maceration Preferable to Percolation.*—Eugene G. Southwick considers the process of percolation to be a very indefinite method of extracting the medicinal properties of powdered drugs. After following

the official process to the letter, for making the tincture of opium, for instance, he has often been obliged to resort to maceration to complete the preparation and obtain a finishing tincture fully up to the standard of the Pharmacopœia. His experience has taught him that treating a drug at the proper fineness of powder in a suitable vessel with the menstruum and allowing it to stand a definite time is the best method of extracting the active principles without the unnecessary evaporation which occurs in the process of percolation, while also minimizing the expense of percolating apparatus and the dangers which so often happen of not properly packing the drug so that the solvent will pass through properly. The cost will be less, the finished product more definite, the loss by evaporation practically none, and the quality absolutely the same each time. With the single exception of tincture of opium, the author practically suggests the preparation of all the tinctures by direct maceration of the powdered drug in a definite quantity of the prescribed menstruum for 48 hours, while tincture of opium is manipulated differently, only in that the opium is reduced to a smooth paste with boiling water, the necessary quantity of alcohol added, and then macerated in the same way for the same length of time.—Mercks' Rep., Feb., 1903, 35–36.

*Percolation versus Maceration—Relative Advantages.*—Prof. L. E. Sayre also speaks a good word in favor of the process of maceration in the preparation of tinctures. Tinctures made by maceration are likely to be of uniform potency but variable in quantity, more or less of the tincture remaining in the marc; while tinctures made by percolation are likely to produce, with uniformity in volume, variable potency—the latter depending upon the care and skill with which the process of percolation is conducted. While it is held by some that the maceration process is wasteful, it is questionable whether it is so to the average druggist, whose time is of more value than the "waste" attended by the process. If, the author says, this assumption is correct, there appears to be no reason why we may not adopt maceration as an alternative process in many of the tinctures. The British Pharmacopœia employs it in the following tinctures: Aurantii, aloes, asafetidæ, benzoini composita; columbæ, cantharadis, capsici, cardamomi composita, catechu, cocci, croci, gentianæ composita, guaiaci ammoniata, kino, lavandulæ composita, limonis, lupuli, myrrhæ, opii, pruni virginianæ, quassiæ, tolutana, scillæ, sennæ composita, sumbul and valerianæ ammoniata.—Drug. Circ., June, 1903, 115.

*Tinctures of Potent Remedies—Experimental Criticisms of the Proposed International Standard.*—In view of the fact that the menstruum that is to be used for making the proposed international standard tinctures (see "Potent Medicaments"), is, in many cases, so different from that directed in the U. S. P. for similar preparations, M. I. Wilbert has made experiments to see what, if any, advantage might be derived from following

implicitly the directions of the Brussels Conference. The apparent advantages that would result from the adoption of these standard formulas by all the pharmacopœias are: Uniformity in strength for all the tinctures of active drugs that are made by percolation—or, rather, in the absolute quantity of drug used to make a given quantity of tincture; uniformity in the alcoholic strength of the menstruum, which is 70 per cent. for all potent tinctures, with the exception of tincture of iodine; enhancement of stability and decrease of inert and useless material extracted; and assurance of complete exhaustion of the different drugs by percolation with the directed menstruum. Mr. Wilbert calls attention to the fact, possibly overlooked by some American pharmacists, that, the proportions being 100 Gm. of the drug to 1000 Gm. of the finished tincture, the relation of weight of drug to volume is necessarily dependent on the specific gravity of the tincture, and in his experiments he shows that this relation is practically 9 parts by weight to 100 parts by volume (9 Gm. in 100 Cc.), as will be evident on consulting the following table which has been constructed from the data given in Mr. Wilbert's paper:

| Tincture. | Required percentage of alkaloid in air-dry drug. | Loss of air-dry drug on drying to constant weight. | Amount of dry extractive from air-dry drug. | Volume of 1000 Gm. of tincture at 25° C. | Weight of 1000 Cc. of tincture at 25° C. | Average dose of U. S. Pharmacopœia tincture. | Average dose of Standard tincture. |
|---|---|---|---|---|---|---|---|
| | Per cent. | Per cent. | Per cent. | Cc. | Gm. | Cc. | Cc. |
| Aconite | —— | 8 | 32 | 1104 | 906 | 0.03–0.20 | 0.10–0.70 |
| Belladonna | —— | 4 | 28.5 | 1106 | 904 | 0.06–0.50 | 0.10–0.70 |
| Cantharides | —— | 3 | 24.5 | 1092 | 900 | 0.20–1.00 | 0.10–0.50 |
| Colchicum seed | —— | 4 | 20.3 | 1104 | 901 | 0.60–4.00 | 1.00–5.00 |
| Digitalis | —— | 5 | 39 | 1107 | 905 | 0.20–1.50 | 0.30–2.00 |
| Hyoscyamus | —— | 6 | 31.5 | 1102 | 902 | 0.64–3.00 | 1.00–4.00 |
| Iodine | —— | —— | —— | 1160 | 880 | —— | —— |
| Ipecac | —— | 4 | 24 | 1108 | 900 | —— | —— |
| Lobelia | —— | 4 | 24.6 | 1106 | 903 | 0.30–1.00 | 0.50–2.00 |
| Nux vomica | 2.5 | 7 | 16.5 | 1108.5 | 896 | 0.40–1.50 | 0.50–2.00 |
| Opium | 10 | 2 (=powder) | 66 | 1108 | 908 | 0.40–1.50 | 0.50–2.00 |
| Strophanthus | —— | 4 | 28 | 1108 | 896 | 0.20–0.80 | 0.10–0.50 |

The percentage of loss on drying the drug was determined by heating in a steam-box at a temperature of 60° C. until, after two hours' interval, there was no perceptible difference in weight. The quantity of extractive was determined by drying the exhausted drug in the same way and calculating the difference, making allowance for the loss of weight in drying the original drug, as in the following example: 100 Gm. of coarsely-powdered aconite root lost in drying 8 Gm.; the residue, after percolation, and drug weighed 60 Gm., showing a gross loss of 40 Gm., from which 8 Gm. was deducted, leaving 32 Gm., or per cent., as the amount of extractive

taken up by the menstruum. Mr. Wilbert finds that with the single exception of tincture of ipecac the resulting preparations are elegant in appearance, quite permanent, and do not offer any particular difficulties in the method of preparation. The paper is conveniently consulted in connection with Mr. Wilbert's paper on international standards and Dr. Powers' report on the results of the Brussels Conference, which, as noted above, are referred to under "Potent Medicaments," and are abstracted from Amer. Jour. Pharm., Jan., 1903, 1–27.

*Alkaloidal Tinctures of the B. P.—Improvement in Commercial Quality Due to Standardization.*—In 1895 E. H. Farr and R. Wright had examined a number of the alkaloidal tinctures of the B. P., 1885, and found a wide variation in the alkaloidal value of commercial samples. They have now applied the same tests to commercial specimens of the tinctures of belladonna, cinchona, cinchona compound, nux vomica and opium, and to wine of ipecac, these tests consisting in the determination of the alkaloidal strength, extractive value, and specific gravity, and they find that now, under the requirements of standardization, these preparations generally conform well with the B. P. 1898 standards. The sum total of their results, which are exhibited in three tables, show that although the standardization of the preparations submitted to examination has not yet secured that perfect uniformity in strength which is desirable, it has certainly brought about an immense improvement in their character and potency.—Trans. Brit. Pharm. Conf., 1902, 380–382.

*Ammoniated Tinctures, B. P.—Improved Method of Preparation.*—In continuation of his experiments undertaken with the object of improving the method of preparing the ammoniated tinctures of the B. P. (see Proceedings, 1902, 772), W. Lyon has made some further experiments, which he now communicates. For the preparation of

*Ammoniated Tincture of Ergot*, the B. P. directs that an ammoniated alcohol, prepared by mixing 100 Cc. of solution of ammonia with 900 Cc. of alcohol (60 per cent.), be used as a menstruum. In the case of valerian, it was shown that, so far as the amount of extractive contained in the resulting tincture could be taken as a criterion, a better result could be obtained by intimately mixing the solution of ammonia with the powdered drug, packing the marc in a percolator, setting aside for twenty-four hours, then percolating with the alcohol. The following table shows the results obtained by the official method for preparing ammoniated tincture of ergot, and by various modifications of the same:

| Method of Preparation. | Extractive Per Cent. (Grammes in 100 Cc.) |
|---|---|
| (1) B. P. | 5.00 |
| (2) Moisten drug with solution of ammonia, set aside for twenty-four hours, then percolate with alcohol (60 per cent.) | 5.20 |
| (3) Alcohol alone, as a menstruum | 4.40 |
| (4) As (2), but distilled water used instead of alcohol. | 5.80 |

The superiority of Method 2 over the official process is not so marked in the case of ergot as in that of valerian; however, the difference in constitution of the two drugs induces the expectation of such a result.

*Ammoniated Tincture of Guaiac*, being made with a materially stronger ammoniacal menstruum (7.5 per cent. of strong solution of ammonia, equivalent to 22.5 per cent. of solution of ammonia), the author, leaving out of consideration the possible medicinal requirement for the quantity of ammonia, made some experiments to determine the necessity of such from a pharmaceutical aspect. Accordingly, he prepared from the same parcel of guaiacum resin two lots of tincture, one strictly according to the Pharmacopœia, the other according to the pharmacopœial method, but using 10 per cent. ammoniated alcohol. The former, on being estimated, yielded 18.00 per cent., and the latter 17.70 of extractive. The difference, small though it be, is in favor of the official formula. Even though the results had been the other way, however, the modified method is not to be recommended for guaiacum, because, when mixed with solution of ammonia, especially the strong solution, it becomes very hard, and not readily accessible to the alcohol. The ammonia method appears to the greatest advantage where the alcohol-soluble matter is comparatively small, and where it is readily accessible, owing to the ligneous and impervious nature of the drug. Its penetrating power enables it to make pathway easier for the alcohol.—Pharm. Journ., Nov. 1, 1902, 437.

*Tinctures—Deposits Possibly Caused by Enzymes.*—Professor Kunz-Krause has investigated the causes of the deposits formed in tinctures and finds that in addition to the hitherto recognized causes: evaporation, change of temperature, exposure to air, etc., various changes may be caused by the enzymes naturally present in the plants which pass into the drugs and into the tinctures prepared from them. These enzymes one author classifies as follows:

(1) Hydrolytic enzymes which enable the substances they act upon to take up one or more molecules of water, and split up into other bodies; amongst such enzymes the following must be numbered: (*a*) Diastase, inulase, cytase, which convert starch and other polysaccharides or polyoses of the formula $C_6H_{10}O_5$ into various soluble compounds. (*b*) Invertase, maltase, lactase, trehalase, raffinase, and melizitase which convert bioses of the formula $C_{12}H_{22}O_{11}$, such as cane sugar, maltose, lactose, etc., into monosaccharides (monoses). (*c*) Lipase, which splits up fats into fat acids and glycerin. (*d*) Emulsin, which splits up amygdalin into benzaldehyde-cyanhydrin and glucose. (*e*) Urease, which converts urea into ammonium carbonate. (*f*) Pepsin and trypsin.

(2) Autolytic enzymes, which effect decomposition without the absorption of water: (*a*) Zymase, which converts glucose into alcohol and carbon dioxide. (*b*) Myrosin.

(3) Coagulating enzymes: (*a*) Rennet ferment, which coagulates milk.

(*b*) Thrombose, which coagulates blood. (*c*) Pectase, which converts the so-called pectins into gelatinous masses.

(4) Oxidizing enzymes or oxydases: (*a*) Laccase, which was isolated in 1883 from the Japanese lac tree. (*b*) Tyrosinase, which oxidizes tyrosin and other aromatic compounds. (*c*) Oenoxydases, which decolorize wire, etc. (*d*) Various oxydases of animal origin.

Recent investigations have shown that oxydases are very widely distributed in the vegetable world, and are probably the principal causes of the changes due to oxidation that are observed in tinctures.—Pharm. Centralh., 1902, 659. .

*Tincture Marcs—Apparatus for the Recovery of Alcohol.*—F. C. J. Bird some years ago (see Proceedings, 1895,) described an apparatus for the recovery of alcohol by direct distillation of the exhausted marcs from tinctures, etc. In this apparatus the marc is spread on a large and shallow evaporating dish, with a condensing cover, cooled by running water, and having its bottom dished up in the form of a cone, supported a short distance above the marc. On the application of heat the alcohol vapor is condensed on the surface and trickles into a narrow trough. Mr. Bird has now placed an improved apparatus constructed on these lines on the market, a description of which is given in some detail. The essentials are that in the recovery of alcohol from marcs by the aid of this apparatus, no part of the heated material is more than ¾-inch to 1 inch distant from a heating surface. This is a point of the first importance, the difficulty in practice having always been caused by the non-conducting nature of the solid marc, which prevents the removal of spirit from the marc not immediately in contact with the heated surface. Mr. Bird finds that it is possible to remove very considerable quantities of alcohol from marcs which have previously been subjected to the strongest pressure. With some drugs it will be found practicable to dispense with pressure altogether, the wet marc being transferred direct to the still when the required quantity of percolate has been collected. Although the principal object of this apparatus is the recovery of alcohol from tincture marcs, it may quite easily be used for the evaporation of liquids, the drying of solid materials, and for all volatile liquids in contact with solid and semi-solid materials.—Pharm. Journ., Jan. 31, 1903, 135.

*Tincture of Arnica—Manipulation.*—H. F. Ruhl finds that when following the official directions for preparing tincture of arnica it is impracticable to exhaust the arnica flowers, and a light-colored tincture is produced. He attributes this to the disproportion in the bulk of the flowers to the finished product, and to the failure to direct maceration and overcome the difficulty by successively macerating and percolating the produced flowers as follows: The powder is packed as directed in the Pharmacopœia, and menstruum poured on to saturate the drug and leave a

stratum above it. When the liquid begins to drop from the percolator the orifice is closed for forty-eight hours; then percolation is allowed to proceed slowly until one-fourth the required percolate is obtained, the orifice again closed and the contents allowed to macerate twelve hours, after which another one-fourth is allowed to percolate. This operation being then repeated twice more, the whole of the percolate is obtained and used as finished tincture, the drug being practically exhausted. The author, however, recommends that the percolation be continued to complete exhaustion with fresh menstruum, and the weak percolate so obtained used in the next operation.—Amer. Jour. Pharm., Sept., 1902, 427–428; Proc. Pa. Phar. Assoc., 1902, 104.

*Compound Tincture of Gentian, B. P.—Suggested Standard.*—Geo. E. Perry states that he has been unable to obtain results conforming to the suggested standard for compound tincture of gentian—5 to 5.5 per cent. of solid residue, and a sp. gr. ranging from 0.964 to 0.970—when making this tincture in accordance with the directions of the B. P. In his own experience, if the directions stand as at present, it would seem that a total solid residue of about 4.5 per cent. and a sp. gr. of about 0.962 more correctly represents what is obtainable in making this tincture in pharmacopœial quantities and without any modification of the pharmacopœial process. A more complete exhaustion of the material and doubtless greater uniformity in the product would result if, in making the tincture, the ingredients were reduced to a more or less coarse powder before being placed in the menstruum. Absolute uniformity, however, it would not be possible to get by this means.—Pharm. Journ., Mar. 21, 1903, 420.

*Tincture of Ginger—Economical Preparation.*—J. P. Gilmour suggests that instead of trying to recover the alcohol from the marc remaining after percolating ginger by resorting to expression, the greater part of the alcohol can be forced out by percolation with water and used in a subsequent preparation of tinctures of ginger. In an experiment in which 30 ozs. of alcohol were used to obtain 20 ozs. of conc. tincture, 9 ozs. of alcohol were thus recovered—the colored ring evidenced at the line of contact of the water with the marc containing alcohol being clearly defined and serving as a guide for the operation.—Pharm. Journ., Jan. 24, 1903, 95.

*Tincture of Iodine—Commercial Preparation.*—P. H. Utech finds it convenient to prepare tincture of iodine as follows: Introduce about 900 Cc. of alcohol into a chemical flask of one liter capacity. Place the iodine (70 Gm.) in a muslin bag and suspend by means of a string until the contents appear just below the surface of the liquid. Cork securely and let stand perfectly still for 20 or 30 minutes, then remove the muslin bag and wash with alcohol sufficient to make 1000 Cc.—Proc. Pa. Pharm. Assoc., 1902, 143.

*Tincture of Iodine—Decomposition Factors.*—An experimental inquiry

into the factors concerned in the decomposition of tincture of iodine, leads E. Beuttner to the conclusion that heat promotes this decomposition more rapidly than access of air or light, and that the tincture should not be kept on hand, except in small quantities for emergencies.—Amer. Journ. Pharm., Sept., 1902, 446; from Schw. Woch. f. Chem. and Pharm., 1902.

*Tincture of Iodine—Addition of Borax to Prevent the Formation of Hydriodic Acid.*—It is stated in "Rev. de Nouv. Rim." (1903, 151), that an alcoholic solution of iodine that is not readily decomposed to hydriodic acid may be prepared as follows: Dissolve 1 part of iodine in 12 parts, by weight, of 90 per cent. alcohol, and add 2 parts of powdered borax.—Amer. Journ. Pharm., June, 1903, 291.

*Tincture of Opium—Modification of Method of Preparation and Assay.*—Edsel A. Ruddiman after a critical review of the U. S. Pharmacopœia and other methods for preparing tincture of opium, recommends to exhaust the opium with water as directed in the process for making deodorized tincture of opium, or in that for assaying opium, reserving the first portion of the percolate and evaporating the second portion, so that when the two are mixed they will measure one-half of the amount of laudanum to be made. To this mixture an equal volume of alcohol is added and sufficient water to allow for the contraction of alcohol and water. Tinctures made in this way, when assayed, contain the amount of morphine indicated by the assay of opium. While this process is tedious on account of the evaporation necessary, yet there is no reason why the tinctures so made should not be much better than those generally found on the market. In applying the official method for the

*Assay of Tincture of Opium* a few modifications have also been made by the author. For instance, after evaporating the tincture to 20 cubic centimeters and adding 40 cubic centimeters of water, the mixture is allowed to stand for several hours or over night, thus giving the precipitate time to settle. This very materially aids filtration, as a large number of samples will filter slowly if filtered at the end of an hour. Another modification is to shake the mixture of alcohol, ether, ammonia, and aqueous extract of opium for fifteen minutes, instead of ten, since, according to experiments made by the writer, the extra five minutes' shaking increases the yield of morphine slightly. Shaking for a half hour or an hour has no further effect on increasing the yield. A hardened filter-paper is used instead of the double filter as directed. Morphine crystals can be readily removed from a hardened filter to a watch glass without loss.—Bull. Pharm., Sept., 1902, 368–369.

*Tincture of Opium — Manipulation in Assaying by Stevens' Method.*—In order to render his method (see Proceedings, 1902, 863) applicable to the assay of tincture of opium, Prof. A. B. Stevens has adopted the following modification: In a tared capsule evaporate 40 Cc. of the tincture

to 8 Gm., add 2 Gm. of freshly slaked lime and rub to a uniform mixture. Transfer to a graduated cylinder, rinsing the capsule with sufficient water to make about 30 Cc. Drop upon the surface of the liquid five or ten drops of ether, thus destroying the air bubbles. Add water to exactly 31 Cc., close the cylinder with a cork and shake frequently during half an hour. Filter, and from 15 Cc. of the filtrate estimate the morphine as in powdered opium. The number of cubic centimeters of acid consumed multiplied by 0.15037 plus 0.112 gives the number of grams of morphine in 100 Cc. of the tincture.—Pharm. Rec., Oct., 1902, 464.

*Deodorized Tincture of Opium—Value of Paraffin as the Deodorizing Solvent.*—Referring to Mr. Eberts' method of preparing deodorized opium preparations (see Proceedings, 1902, 770), Edwin Hodgson gives the results of his experience with paraffin as the deodorizing agent in making the deodorized tincture. Extracting opium in the usual way, with water, the concentrated solution was assayed before and after treatment with paraffin. 5 fl. ozs. of this liquid assayed 43 grains of morphine before treatment, and 42½ grains after treatment. This points out that there is practically no loss of morphine, due to solution of some of it in the paraffin. In fact, the author was unable to find any alkaloid in the paraffin except narcotine.—Merck's Rep., Dec., 1902, 462.

## UNGUENTA.

*External Preparations and their Therapy.*—At the recent annual meeting of the American Medical Association (New Orleans), Prof. Carl S. N. Hallberg read a comprehensive paper before the Section on Materia Medica, Pharmacy and Therapeutics, in which he deals exhaustively with external preparations in general, and their therapy, under the following headings: Ointment Vehicles; Therapeutic Grouping (of the same); Suppositories; Cerates; Plasters; Oleates; Liniments; Collodions; Modern Dermatological Preparations; Sterile Solutions; Hypodermic Injections; Antiseptic Gauze. He also gives formulas for a number of preparations, particularly medicated pastes, medicated gelatines, and hypodermic injections, which need not be reproduced here, but may be conveniently consulted in the reprint of the author's paper in Amer. Journ. Pharm., June, 1903, 274–284.

*Inunctions of Oleo-Stearates and Oleo-Palmitates—Typical Formula.*—In connnection with his working process for preparing zinc oleo-stearate (which see) Frederic E. Niece gives the following formula for a

*Mixture of Oleo-Palmitate of Zinc with Boric and Carbolic Acids:* Powdered oleo-palmitate of zinc, ℥ij; boric acid, ℈j; solution (sic) acid carbolic, ♏v; liquid petroleum (white), q. s. ℥ij. To be shaken before using. In a similar way a large number of substances can be incorporated with the oleo-stearate or oleo-palmitate of the metals, according to the medicinal effect desired.—Proc. Pa. Pharm. Assoc., 1902, 138.

*Petrolatum Ointments—Liability to Separate.*—Attention is called in Pharmaceutische Centralhalle (1902, 605) to the separation of ointments containing solid ingredients, to which such made with petrolatum are especially subject. It is advisable, therefore, to mix such ointments at intervals, and particularly before dispensing, so as to insure their homogeneity.

*Mercurial Ointment—Unfavorable Effect of Oleate Used for the Extinction of the Mercury.*—The "Südd. Apoth. Zeit." calls attention to the observation that in the determination of mercury in mercurial ointment, by treatment with ether for the removal of fat, appreciable quantities of mercury enter into the solution, while the residual mercury contains compounds insoluble in ether which prevent it running together. This unfavorable condition is attributed to the age, but more particularly also to the presence of oleate, employed for the extinction of the metal.—Pharm. Centralh., 1903.

*Mercury Ointment—Estimation of Mercury and Detection of Fixed Adulterants.*—G. Pegurier recommends for the convenient estimation of mercury ointment that an accurately measured quantity be weighed, and then weighing an equal measure of the ointment base, or of a mercury ointment of known mercury content, the difference would indicate the per cent. amount of mercury in the sample. The presence of powdered slate or coal is detected by heating a portion of the ointment to redness in a porcelain dish. If pure mercury ointment, it is completely volatilized.—Pharm. Ztg., 1902, 956; from L'Union Pharm.

*Oxide of Zinc Ointment—Practical Manipulation.*—A perfectly smooth ointment of zinc oxide is conveniently obtained, according to J. F. Gilman, if the zinc oxide is rubbed to a smooth paste with a portion of hot lard, then forced through a muslin strainer, and the strainer washed—so to speak—with the remaining portion of lard, previously melted; finishing by trituration or storing until cool.—Pharm. Journ., Jan. 24, 1903, 96.

*Lanolin Cold Cream—Formula.*—The following formula for a lanolin cold cream, containing soap, is given in "Zeitschr. d. Allg. Oest. Apoth. Ver." (1903, 497): Take of lanolin, white vaseline, lanolin soap and rose water, equal parts. Dissolve the soap in the rose water, melt the lanolin and vaseline together, and add the latter mixture to the former with constant stirring, which continue until cool.—Amer. Jour. Pharm., June, 1903, 290.

*Lanum Cold Cream—Formula.*—According to A. E. Hiss a really very fine and excellent lanum cold-cream may be made according to this formula:

| | |
|---|---|
| Purified hydrous wool fat | 8 ozs. |
| Purified anhydrous lard | 8 ozs. |
| Glycerin | 4 fl. ozs. |
| Rose water | 12 fl. ozs. |
| Lard oil, pure, sufficient. | |
| Oil rose geranium | 4 fl. drs. |

Mix the wool-fat and lard, and gradually incorporate the mixed glycerin and rose water; when well mixed, add the oil of rose geranium. The lard oil is only to be added in case the mixture is deemed too thick.—Merck's Rep., March, 1903, 68.

*Emollient Pine Ointment—Formula.*—The following formula for an emollient pine ointment is recommended in "Merck's Report" (Dec., 1902, 482): Lanum, 27 Gm.; white petrolatum, 45 Gm.; white wax, 23 Gm.; oil of pinus sylvestris, 4 Cc.; oil of juniper, 1 Cc. Melt the solid ingredients on a water-bath. Allow to partially cool, stir in the oils, and continue the stirring until a uniform, smooth ointment is obtained.

*Ointment—A Good Formula.*—A. E. Hiss recommends the following formula which produces a good all around ointment, being antiseptic, emollient and soothing, and consequently useful as an application in skin diseases and for burns and scalds. The following is a good combination:

| | |
|---|---|
| Salicylic acid | 4 drs. |
| Ichthyol | 1 oz. |
| Precipitated sulphur | 5 ozs. |
| Zinc oxide | 5 ozs. |
| Pine tar | 5 ozs. |
| Petrolatum | 10 ozs. |
| Oil rosemary | 2 fl. drs. |

The oil is added to give the mixture an agreeable odor.—Merck's Rep., April, 1903, 98.

VINA.

*Flavored Wines—Practical Formulas.*—The following formulas for "flavored wines" are recommended in "Merck's Report" (July, 1902, 296):

*Lemon Wine.*—The fine-cut peel of 4 to 5 lemons is treated with sherry, 1000 Gm. and cognac, 300 Gm., and filtered after 25 hours. To the filtrate add orange-flower water, 50 Gm.

*Pineapple Wine.*—A pineapple of about 500 Gm. and one-quarter of a vanilla pod are cut up and macerated with port wine, 1,300 Gm. and cognac, 200 Gm.; allow to stand two days, and filter without strong pressure.

*Orange Wines.*—Two blood oranges are stuck with cloves, and the whole fruit is then covered with burgundy, 1000 Gm., cognac, 300 Gm., and alcohol (90 per cent.), 200 Gm., and filtered after standing for four days.

MISCELLANEOUS FORMULAS.

*Milk Substitutes and Foods for Children—Methods of Preparation.*—Dr. Fisher suggests the following substitutes for milk and methods for the preparation of foods suitable for temporary use in gastric and intestinal derangements of children:

*Barley Water.*—This can best be made by taking one heaping tablespoonful of ground barley flour and adding the same to one pint of water. Boil this thoroughly for half an hour, then strain through cheese-cloth and add enough water to make one pint of barley water. Is is advisable to sweeten by adding one heaping teaspoonful of granulated sugar. When sugar is contraindicated, as in fermentative conditions, add saccharin. When barley water is given for any length of time, and constipation results therefrom, then glycerin should be added. One teaspoonful of glycerin to each teacupful of barley water will make the same quite palatable, and will offset the constipating tendency.

*Oatmeal Water.*—This can be made by adding one tablespoonful of oatmeal flour to a pint of water, boiling the same in the manner described in the preparation of barley water. If the child is underfed, then frequently the addition of the white of a raw egg, well beaten, with either of the above-mentioned barley water or oatmeal water, will be found advantageous.

*Vegetable Proteids.*—Great success is frequently scored by vegetarians, especially by the use of the celebrated vegetable milks. When we consider the ingredients used, it is no wonder that they offer good temporary, and often permanent, substitutes for animal milks. The author has frequently recommended the use of

*Almond Milk*, which, when it is to be used as the only substitute for milk, may be prepared as follows: Scald about one to two ounces of sweetened almonds, removing the skin; then add about eight ounces of fresh water and mash the almonds to a pulp; boil this pulp with the water for about fifteen or twenty minutes; next strain through cheese-cloth and add enough water to make one pint. Finally add one tablespoonful of granulated sugar. This can be given *ad libitum*, depending upon the age of the child to be fed. It is certainly a very nutritious substitute for milk containing proteid.

*Vegetable Soup Substitutes.*—Mashed peas, boiled with beef or chicken or veal, offer a very nutritious proteid substitute for milk. This will be found especially advantageous during the hot summer months, when milk is not well borne, and when the physician requires a nutritious food which can be fed in doses of two, three, four, six or eight ounces at proper intervals, just exactly as milk would have been given.

*Tea as a Substitute.*—Weakened mixed tea is frequently of great service with or without the white of egg. When children have diarrhœa and

milk cannot be given, then dextrinized wheat or dextrinized barley or dextrinized rice offers a convenient and valuable substitute. It may also be given with barley water.—West. Drug., Feb., 1903, 80; from Medical Record.

*Nutritive Lemonade—Preparation.*—Dr. Leftwich recommends the use of the following nutritive lemonade for invalids, especially for children, suffering from febrile diseases. It is very palatable, and is rather more nutritive than "beef-tea." Two lemons are peeled twice, the inner white peel rejected, and the yellow peel with the sliced fruit placed in a quart jug with, say two lumps of sugar. Pour boiling water on them, and stir occasionally. When cooled to the temperature of ordinary tea, insert an egg whisk, and slowly add the whites of two new-laid eggs. Continue whisking for two or three minutes, and strain while still hot through muslin. Serve when cold. For non-febrile patients with clean tongues two or more eggs may be used for a pint of the liquid, and the nutritive value thereby increased. In typhoid, the use of this lemonade in conjunction with the free administration of milk serves as a valuable means of maintaining the strength of the patient. Children, who often show an aversion to "beef-tea," readily take the lemonade. When fresh lemons are scarce, citric acid and lemon oil may be substituted for the fresh fruit.—Pharm. Journ., Nov. 15, 1902, 516; from Therap. Gaz., *26*, 618.

*Liquid Beef Preparations—Characters of Efficiency.*—A. R. L. Dohme, in reply to a query, says that if a "liquid beef preparation" is correctly made, *i. e.*, from fresh beef by peptic and tryptic digestion, and then so treated as to keep it without preservatives, and with sufficient wine or alcohol to render it a stimulant, it can certainly be said with ample confidence to be nutritive and stimulating. As we all know, beef contains proteids, salts, carbohydrates, fats, xanthine and creatine bases and many other substances, and in order to make it nutritious for the invalid and the convalescent, we must digest all of these so that they will be palatable to, retained by, and absorbable by the alimentary tract. The xanthine and creatine bases should be removed, as they are not nutritious or stimulating, and often do injury to the system in one way or another. The proteids should be digested to the form of peptones or hetero-albumoses, and the important feature is that they should be digested far enough to get them to the peptone stage. The salts should be retained, the carbohydrates should be digested to the hexose stage, and the fats removed. Any liquid beef preparation that contains the properly-digested proteids and carbohydrates and the salts of prime, fresh beef, will prove nutritious, and provided they contain no flavors but sufficient wine or alcohol, will also prove amply stimulating to the invalid or convalescent. Their nutritious value can be estimated by determining (1) the amount of peptones, (2) the amount of hexoses, and (3) the amount and nature of inorganic salts.—Merck's Rep., Sept., 1902, 348; from Proc. Md. Pharm. Assoc., 1902.

*Dermatological Preparation for the Scalp—Unna's Formulas.*—The following formulas, used by Dr. Unna in treating various affections of the scalp and hair, are given in "West. Drug." (Mar., 1903, 121):

*Boro-Chloroform Alcohol.*—Boric acid, 1 Gm.; alcohol, 100 Gm.; chloroform, 5 Gm.

*Sublimate Vinegar.*—Acetic acid, 1 Gm.; Van Swieten's liquor, 100 Gm.; Van Swieten's liquor may be replaced by 10 Cgm. sublimate in 1 Gm. of alcohol, and 99 Gm. water.

*Ichthyol-Salicylic Soap.*—Ichthyol, 10 Gm.; salicylic acid, 5 Gm.; salve soap, 85 Gm.

*Iodosublimate Solution.*—Corrosive sublimate, 10 Cgm.; glycerin, 10 Gm.; tincture of iodin, 90 Gm.

*Croton-Oil Pencils.*—Croton oil, 5 Gm.; wool fat, 2.50 Gm.; yellow wax, 2.50 Gm.

*Compound Chrysarobin Ointment.*—Chrysarobin, 5 Gm.; ichthyol, 5 Gm.; salicylic acid, 2 Gm.; fat (wool?), 30 Gm.; vaselin, 58 Gm.

*Hair Tonics—Formulas.*—A. E. Hiss recommends the following formulas for making good "hair tonics:" No. 1. Mix together 4 fl. ozs. each of aromatic spirit of ammonia, tincture of cantharides and glycerin, add to 52 fl. ozs. of bay rum, and filter through talcum. No. 2. Quinine sulphate, 150 grs.; castor oil, 4 fl. ozs.; tincture of cantharides, 4 fl. ozs.; oil of bay, 1 fl. dr.; alcohol, 56 fl. ozs. Mix, and when quinine is dissolved, filter. An excellent

*Dandruff Cure* is obtained by the following formula: Chloral hydrate, 2 ozs.; resorcin, 1 oz.; tannin, 1 oz.; alcohol, 8 fl. ozs.; glycerin, 4 fl. ozs.; rose water, enough to make 4 pints.—Merck's Rep., April, 1903, 97.

*Dentifrices—Preparation with Hydrogen Peroxide.*—H. Kuhl discusses the value of hydrogen peroxide as a disinfecting and deodorizing agent in toilet preparations, and recommends as tooth-paste—calcium carbonate, 5 parts; soap, 1 part; rubbed up with glycerin and hydrogen peroxide solution, equal parts, to a suitable consistence. For a tooth-wash—glycerin, 2 parts; hydrogen peroxide solution, 2 parts, and rose water, 1 part, are recommended.—Apoth. Ztg., 1902, 705.

*Sunburn Remedies—Practical Formulas.*—The following formulas for "sunburn remedies" are recommended in "Mercks' Report" (July, 1902, 296):

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| No. 1. | Zinc sulphocarbolate | 1 part. |
| | Glycerin | 20 parts. |
| | Rose water | 70 parts. |
| | Alcohol (90 per cent.) | 8 parts. |
| | Cologne water | 1 part. |
| | Spirit of camphor | 1 part. |

| | | |
|---|---|---|
| No. 2. | Borax | 4 parts. |
| | Potassium chlorate | 2 parts. |
| | Glycerin | 10 parts. |
| | Alcohol | 4 parts. |
| | Rose water, to make | 90 parts. |
| No. 3. | Citric acid | 2 drs. |
| | Ferrous sulphate (cryst.) | 18 grs. |
| | Camphor | 2 grs. |
| | Elder-flower water | 3 fl. ozs. |
| No. 4. | Potassium carbonate | 3 parts. |
| | Sodium chloride | 2 parts. |
| | Orange-flower water | 15 parts. |
| | Rose water | 65 parts. |
| No. 5. | Boroglycerin (50 per cent.) | 1 part. |
| | Ichthyol | 1 part. |
| | Cold cream | 9 parts. |
| No. 6. | Sodium bicarbonate | 1 part. |
| | Cold cream | 7 parts. |
| No. 7. | Ichthyol | 1 fl. dr. |
| | Expressed oil of almond | 2 fl. drs. |
| | Lanum | 6 drs. |
| | Cold cream | 6 drs. |

Apply thrice daily.

*Headache Cures—Competitive Formulas.*—The Tennessee State Druggists Association having offered prizes for certain pharmaceutical preparations, the following formulas for headache cures have been presented in competition:

(1) *Headache Cure.*—A. B. Rains proposes: Caffeine, alkaloid, 640 grs.; ammonium carb., 640 grs.; elix. guarana, 32 ozs. Dose, one teaspoonful every hour until relieved.

(2) *Improved Headache Powder.*—B. B. Kerr proposes: Acetanilid, 36 grs.; cit. caffeine, 18 grs.; sodium bicarb., 6 grs.; fl. ext. celery, 3 drops. Mix and divide into 12 powders.

(3) *Headache Powder.*—J. Goldbaum proposes: Acetanilid, 6 lbs.; sodium bi-carb., 2 lbs.; chloride ammon., 1 lb.; citrate caffeine, 1 lb. Dose not given.—Proc. Tenn. State Drug. Assoc., 1902, 50–52 and 54.

*Deodorized Benzin—Formula.*—The following formula for deodorized benzin is recommended in "Merck's Report" (Aug., 1902, 336):

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| Benzin | 1 pint. |
| Oil lavender | 1 dr. |
| Potassium bichromate | 1 oz. |
| Sulphuric acid | 1 oz. |
| Water | 1 pint. |

Dissolve the potassium bichromate in the water, add the acid, and when the solution is cold shake up the benzin with it. Shake every hour during the day, allow to stand all night, decant the benzin, wash with a pint of water, and again decant. Lastly, add the oil lavender.

*Toilet Ammonia—Formula.*—A preparation that has become quite popular in the experience of H. B. Palmer, is made according to the following formula:

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|---|---|
| Ammonia water, 10 per cent | 250 Cc. |
| Green soap | 120 Gm. |
| Oleic acid | 10 Cc. |
| Oil bay | 1 Cc. |
| Oil rosemary | 1 Cc. |
| Oil verbena | 5 Cc. |
| Water, sufficient to make | 1000 Cc. |

Dissolve the soap in warm water 500 Cc., and when cool add the water of ammonia and the oils; mix by agitation and add lastly the oleic acid and water to make 1,000 Cc.—Amer. Drug., June 8, 1903, 314.

*Insect-Destroyer—Formula.*—H. P. Pettigrew recommends the following formula for an efficient "bed-bug destroyer:" Napthaline, in flakes, 4 lbs.; alkanet root, bruised, 5 ozs.; oil of mirbane, 8 fl. ozs.; gasoline, enough to make one gallon. Introduce these ingredients into a five-gallon can, cork tightly, and "kick it around on the floor" at intervals of a week or so, until a saturated solution is obtained, then filter. It is conveniently put up in bottles provided with an extra "squirt cork" consisting of a quill tooth-pick stuck tightly through a cork to fit, so that the quill projects above the cork about half an inch, and cut off even on inside.—West. Drug., Febr., 1903, 62.

## C. New Remedies

### and trade-named specialties.

*New Remedies—Enormous Number.*—In his quarterly review on the "Progress of Pharmacy" (Amer. Jour. Pharm., Sept., 1902), M. I. Wilbert calls attention to the enormous number of "new remedies" that have been foisted on the public during the last ten years, as revealed by "A list of the newer remedies arranged according to their trade names and also their scientific names. By Hugo Mentzel, Dresden." Some idea of the vastness of this number may be had from the fact that 418 separate titles are given under the single letter A, from abrazol to azurin, and this, according to Mr. Wilbert's observation, does not embrace upward of fifty American remedies, which have evidently escaped the attention of the European compiler. The following have been noted and discussed during the year covered by this report:

*Acetozone* is the name now given to "benzyl acetyl peroxide," formerly called "benzozone," and is recommended as a powerful oxidizing agent and germicide. Owing to the ease with which it decomposes when brought in contact with glycerin, alcohol and other organic solvents, the manufacturers particularly caution buyers not to bring it in contact with organic matter, or even to keep it in a warm place (Amer. Jour. Pharm., Sept., 1902, 441). The application of

*Acetozone*, being almost exclusively in form of solution, the following directions are given in the "Pharm. Era" (Feb. 26, 1903, 223): In a bottle of sufficient size place one-half gallon of clean or pure water, at a temperature not so high as to be uncomfortable to the hand. To this add 30 grains of acetozone powder, shake vigorously, and allow to stand for one or two hours before dispensing. For internal administration it is sufficient to allow the hazy solution to settle, then decant the quantity necessary for immediate use, without filtration. If intended for injection, or as an irrigating fluid in operation or in dressing wounds, filter off the necessary quantity and dilute this clear filtrate with two to five volumes of boiled water, as experience and conditions may dictate. Solutions made in this way should be consumed within three days.

*Acetyl-Quinine*, obtained under a German patent by the action of acetic anhydride on quinine, is almost free from bitter taste. It cannot be crystallized from water or alcohol, since both of these fluids decompose the compound into quimine and acetic acid—a fact which it is well to remember when prescribing or dispensing this compound.—Chem. Ztg., *26* (1902), 931.

*Acoin*, according to Darien, produces local anesthesia only when the epithelium is destroyed. Its action is said to be slower, but more prolonged, than cocaine. It has been employed as a local anesthetic in connection with irritant substances, such as corrosive sublimate or iodine, and satisfactory results have also been obtained with mixtures of cocaine and acoin.—Amer. Journ. Pharm., Dec., 1902, 603; from Journ. des Pract., 1902, 131.

*Aethylquinine* is a bitterless quinine compound which is supplied in form of colorless crystals melting at 116° to 117° C. It is used for the same purpose and in the same doses as the ordinary salts of quinine.—Pharm. Centralh., 1903, 151.

*Amylenol* is the name given to the amylic ester of salicylic acid, which is recommended for the treatment, both externally and internally, of rheumatic pains.

*Anamyl-Bread* is a bread especially prepared for diabetics. It is entirely free from carbohydrates of every kind, and is stated to be composed of almond meal with 20 per cent. of "Roborat" (see Proceedings, 1901, 643) and a little common salt.

*Anthrasol* is the name given to a preparation claimed to represent both coal tar and juniper tar, and to be more efficient and less irritating than ordinary tar for the treatment of certain skin diseases. It is a pale yellow oily liquid, having a strong tarry odor, soluble in benzol, acetone, fixed oils, petrolatum and absolute alcohol, but only sparingly soluble in ordinary (90 per cent.) alcohol. It may be exhibited in form of ointment, paste, petrolatum solution, etc.

*Antidecubin* is the name given to a heavy sheet of felt that is recommended and used as a preventive of bed sores. It is applied very much in the same way as corn and bunion plasters, a suitable hole in the felt relieving pressure on any portion of the surface of the body.—Amer. Jour. Pharm., Dec., 1902, 601.

*Antigermine* is the name given to an odorless, thick, greenish-yellow fluid, containing the copper salt of an organic acid, for which powerful disinfectant and deodorant properties are claimed. It is soluble in water only to the extent of 1 part in 200 parts, but undergoes partial dissociation, an insoluble precipitate being formed.

*Antiseptic Hemostatic—Composition.*—R. Rhode has obtained a German patent for a preparation composed of powd. alum, 50; borax, 10; glycerin, 10; zinc oxide, 5; formaldehyde solution, 10 parts, which are melted together and poured into suitable molds. It is claimed for this that it is an efficient hemostatic, and at the same time antiseptic.—A. J. Phar., March, 1903, 142.

*Antithyreoidin* is the trade name given to "thyreoid serum," which is said to be the serum from sheep that, some six or eight weeks before being bled, have had their thyreoid gland removed. This serum is preserved by the addition of small quantities of carbolic acid. It has been commented on favorably, the dose being 0.5 Cc., gradually increased to 2.0 Cc. three times a day in the treatment of Graves' disease, cretinism and myxoedema, given in sherry or, according to Moebius, preferably in elderberry wine.—Pharm. Centralh., 1902, 495.

*Aphitoxin* is the name given to an insecticide which is described as a yellowish-red liquid, having a powerfully camphoric odor, and containing nicotin, camphor, ammonia, and empyreumatic and soluble oils. It is claimed to be an aqueous extract of fermented tobacco leaves dissolved in oil of camphor.

*Aphthisin* is the name given to a compound of potassium guaiacal sulphonate and petrosulphol. It is supplied in the form of a brown, very hygroscopic powder, soluble in four parts of water. In consequence of its hygroscopic nature it is best prescribed in capsules or in the form of syrup. Dr. J. Frieser has found this compound most serviceable in the treatment of tuberculosis, while Dr. Goldmann found it also to be a valuable remedy in catarrhal affections of the lungs other than those of a tuberculous nature. This dose is from 4 to 5 grains.—Pharm. Post, *35*, (1902), 425.

*Arheol* is the name given to an alcohol, $C_{15}H_{26}O$, which according to Riehl, is contained in commercial oil of sandal in quantities varying from 30 to 90 per cent. It is stated to have the same therapeutic action as sandal oil, but to be without any disturbing effects on the renal functions. It is, in fact, considered to be the active principle of sandal oil. It is an oily, colorless liquid, which is prescribed with success in gonorrhœa in the form of capsules containing 3 grains, ten or twelve of which may be taken daily.—Pharm. Centralh., *44*, 81.

*Aspirin*, or "acetyl salicylic acid," is an extremely unstable compound, being readily decomposed by solvents like water or alcohol. Nevertheless, it appears to find considerable favor by practitioners of medicine, and is variously given in doses of from 0.5 to 2.0 Gm. four or five times a day. Wielch warns against the indiscriminate use of this compound, however, particularly in cases of enteric fever or phthisis, in both of which conditions sudden collapse and other untoward complications have been observed.—Amer. Journ. Pharm., Sept., 1902, 442; from Wiener Med. Presse, 1902.

*Aspirin* is also said to be incompatible with sodium bicarbonate. A writer in L'Union Pharm. (Oct., 1902), calls attention to the liquefaction of a mixture of aspirin, exalgin, and sodium bicarbonate. This is due to the saponification of the aspirin by the alkaline bicarbonate, the acetyl radical of the aspirin (acetyl-salicylic acid) being easily removed by alkalies.—Apoth. Ztg., 1902, 794.

*Aristochin* is the name given to di-quinine carbonate, which is a tasteless, white powder, insoluble in water, but easily soluble in alcohol or chloroform, sparingly only in ether. It melts at 189° C., and forms with hydrochloric acid salts which are soluble in water. Its administration is said to be unaccompanied by the disagreeable effects usually following that of other quinine salts, such as giddiness, ringing in the ears, etc.—Pharm. Ztg., 1902, 857.

*Aulicin* is the name given to a preparation exploited as a cure for anaemia, chlorosis, etc. It is claimed to contain ferric oxide, anise, carduus benedictus, quinine hydrochlorate and juniper berry juice.

*Biogen* is the trade name for what is claimed to be magnesium dioxide, and is put on the market by an American firm, but whether it is the

*Magnesium Dioxide*, for which Dr. Friederich Elias, of Berlin (in Med. Records, *62*, 139), has recently evolved a process, is not known. Wilbert observes in this connection that from three to five parts, by weight, of solution of hydrogen dioxide may be added to one part, by weight, of light calcined magnesia, without decomposition. The resulting mixture may be dried and subsequently powdered, retaining from 60 to 80 per cent. of the contained (originally added? Rep.) oxygen. Specimens of this mixture, made upwards of four months ago, still give the characteristic blue

coloration on the addition of dilute sulphuric acid and a bichromate.—Amer. Journ. Pharm., Sept., 1902, 443.

*Bismuth Iodogallate*, to which the name "Airol" was given by Luedy, and for which a chemical formula has been written, is shown by P. Thibault not to be a definite chemical compound at all, but merely a mixture of bismutho-gallic acid with bismuth tri-iodide. The same is found to be the case with the so-called "bismuth iodogallate" of Frizzi, which is identical with the above. The author shows that the proportion of the two constituents may vary greatly with the method of preparation, and that the supposed definite chemical compounds of bismuth, iodine and gallic acid are non-existent. Methyl alcohol and acetic acid when employed as solvents leave a residue which is solely bismutho-gallic acid. Ethyl alcohol and solution of potassium iodide, by their selective solvent action, also prove that the so-called compounds are mere mixtures.—Pharm. Journ., Oct. 4, 1902, 336; from Journ. Pharm. Chim. [6], *16*, 145.

*Bismutose* is the name given to a patented substitute for bismuth subnitrate, over which the advantage is claimed that it is absolutely innocuous even in continued large doses. Reinhardt outlines the method of its preparation and its physical properties, from which it appears that "bismutose" is an unstable mixture of bismuthyl and albumin.—Pharm. Ztg., 1902, 637.

*Bromochinol* is the trade name given to quinine dibrom-salicylate. It occurs in yellow crystals, melts at 197°–198° C., and is used as an antipyretic and analgesic in doses of 0.5 to 0.75 Gm.

*Bromolein* is the name given to an odorless and tasteless yellow liquid, containing 20 per cent. of bromine, the latter being present as an addition product of the unsaturated fatty acids of almond oil. It is recommended for hypodermatic administration in place of ordinary bromides. Another substitute for the bromides, to be used hypodermatically, is called

*Bromo-Serum.* This is simply a solution of 6 parts of sodium bromide and 1.5 parts of sodium chloride in 1000 parts of water, which may be employed without danger in quantities up to 500 Cc., injected hypodermatically.

*Calaya* is the name given to a proprietary syrup, the active component of which is stated to be an extract of the rhizome of an African plant, *Anneslea febrifuga*, which, in form of decoction, is employed by the natives in the treatment of fevers. The syrup is recommended for the treatment of malaria and typhoid fever in Europe.

*Camphacol* is the name given to the camphoric acid ester of methylene diguaiacol. It occurs in crystals, and is recommended as an antispasmodic, sedative and antiseptic in doses of 5 to 20 grains.

*Camphossil* is the name of a condensation product of camphor and salicylic acid introduced as an antiseptic and antipyretic, chiefly for intestinal

affections, in which it is given in doses of 7½ grains. It is a crystalline, unctuous, deliquescent mass, with a camphoraceous odor. It is almost tasteless and is insoluble in water.—Pharm. Zeit., *48*, 88.

*Carbol-Lysoform* is the name given by Elsner to a mixture of specially-prepared crude phenol and two parts of lysoform, such a mixture having been found more active than either component by itself, while its toxity and odor are much less pronounced.—D. Med. Wochenschr., 1902.

*Carminol* is the name given to a dark crimson-colored powder, having a strong alkaline reaction and the odor of peppermint, which is recommended for the preparation of a mouth-water for cleansing and rinsing the mouth and teeth.

*Catillon's Granules* are said to be granular, each containing one decimilligram (0.0001 Gm.) of extract of strophanthus—from 2 to 4 of them to be given in the course of 24 hours in cases of heart affections which cause variations in the work demanded of the kidneys.

*Chielen* is the name given to a new dermic remedy recommended in place of soap in cases of chronic eczema, but contraindicated in cases of acute and weeping eczema. It is said to be an extract of tulip (? Rep.) and occurs in form of a brownish, sticky, fragrant mass, which is readily soluble in water.—Deut. Med. Woch., xxviii, No. 33.

*Chinaphenin* is the name given to a tasteless quinine compound which is said to be the quinine-carbonic acid ester of phenetidin. It occurs as a white, light, tasteless powder, freely soluble in dilute acids, and in alcohol, ether, or chloroform. It is given in doses of 0.5 to 1.0 Gm. as an antipyretic, analgesic and antineuralgic.—Pharm. Centralh., 1903, 81.

*Citarin* is the name given to the anhydromethyl-sodium citrate, which is supposed to be readily decomposed under liberation of formaldehyde. It is claimed to have a solvent action on uric acid and to increase the solvent properties of urine for uric acid and urates, and on this account useful in cases of gout and chronic rheumatism, is doses of from 2.0 to 3.0 Gm., given 4 times daily.—Pharm. Centralh., 1903, 151.

*Cocainol* is the generic name of a long list of preparations which, contrary to the suggestiveness of the name, contain no cocaine, but contain anæsthesin (see Proceedings, 1902, 788) instead. The preparations are salves, drops, dusting powders, etc., etc., such as "cocainol-dermatol," "cocainol-drops," "cocainol-lanolin," etc.

*Cuprol, Ferrol, Mercurol and Nargol* are the names given to the nucleinates of copper, iron, mercury and silver respectively. They are prepared by adding the oxides of the several metals to a solution of nucleinic acid, and precipitating the compounds produced by an excess of alcohol. These

*Metallic Nucleinates* are soluble in water, and do not respond to the

tests for the metals as do the ordinary salts. Thus the solution of ferrol is not precipitated by ammonia or potassium ferrocyanide, while none of the compounds are affected by hydrogen sulphide, except on long standing. The therapeutic results are said to be good, and it is proposed to use them especially in ophthalmic practice and as injections.—Sch. Woch. f. Chem. u. Pharm., 1902, 627.

*Dionin* has been employed by Darien with advantage in form of a 1 per cent. solution for the relief of pain in the eye, and is recommended also for the relief of pain caused by a decayed tooth.—Amer. Jour. Pharm., Dec., 1902, 603; from Jour. des Pract., 1902, 131.

*Diosmal* is the name given by Paul Runge to a petroleum-ether alcoholic extract of buchu leaves, made by successively extracting the leaves with petroleum ether and strong alcohol, distilling off the solvents, and mixing the residual extracts. The dose is given as 0.1 Gm. or more three times a day.—Pharm. Centralh., 1902, 465.

*Diurazin* is the name given to a condensation product which is said to contain 30 per cent. of theobromine, 55 per cent. of salicylic acid and 6 per cent. of formaldehyde, and is described as being "theobromine acetylmethylene salicylate." It is recommended as being useful in dropsical conditions, the dose being 6 grains. Being insoluble in the gastric juice it passes through the stomach unchanged, becoming active when it reaches the alkaline secretions of the bowels.

*Djoeat* is the name given to a remedy recommended in diabetes, which, according to the proprietor, consists of 42 parts of the fruit of Djoeat jambul, 56 parts of linseed and about 7 parts each of laurel leaves, rosemary blossoms and star anise; 14 parts each of calamus and gentian extract; 26 parts of cinchona extract; 56 parts of sodium chloride, and 7 parts of salicylic acid.

*Dormiol* is the name given to a combination of chloral hydrate and amylene hydrate, and is supplied in form of a colorless, oily liquid having a sweetish taste, being recommended as a sedative and narcotic. E. Baroch has experimented upon twenty-five rabbits, each of which received a slightly different dose. Research has demonstrated that with a dose of 2 Gm. of a 50 per cent. solution (injected into the medullary serous cavity), a sedative action is obtained, followed by a certain degree of lessening of sensibility. Intoxication commenced with doses of 2 to 3 Gm. Death supervened seven to nine hours after an injection of 3.5 Gm., and in two to three hours after 4 Gm. had been injected. It has thus been determined that the lethal dose is equivalent to 1 Gm. per kilogramme weight of the animal, in so far as the rabbit is concerned. Respecting the clinical application of dormiol, the author says that this medicament is far superior to opiates, bromides, sulphonal, trional, etc., and maintains a sort of "half-way" between chloral and amylene. It possesses the advantage of both, but the disadvantages of neither.—Pharm. Journ., Jan. 17, 1903, 62.

*Ectogan* is the name given to zinc peroxide, which is supplied in form of an insoluble, yellow, odorless and tasteless powder, and is recommended in the treatment of wounds and in cases where hydrogen peroxide has been found useful.

*Epithol* is the generic name given to two substances, "epithol-gold" and "epithol-silver," which have been used with advantage in veterinary practice as a dusting powder for freshly-made abrasions and wounds. These substances are stated to consist of alloys of tin and copper in extra fine powder. When applied and pressed firmly on the wound or abrasion, the places so treated appear as if gilded or silvered, the film adhering well and resisting friction; but by means of soap and water the films may be easily removed.—Apoth. Ztg., 1902, 794.

*Eukinase* is the name given by Hallion and Carrion to a special ferment isolated from the duodenal mucous membrane of the pig, which is said to contain in a very active form Pawlow and Delezenne's *enterokinase.* The latter found that a trace of this ferment found in the intestinal walls powerfully increases the digestive action of the pure pancreatic juice on albumin and albuminoids. Eukinase is supplied in form of gluten capsules or granules made with gluten, so that it may pass unaltered into the intestinal tract. Under the n of

*Pancreatikinase* a combination of eukinase with pancreatin is also supplied and recommended as a powerful digestive agent.—Pharm. Journ., Feb. 28, 1903, 340; from Les Nouv. Rem., *19*, 25.

*Euquinine* is the name given to the carbonic-ethylester of quinine. It is a white powder, nearly insoluble in water, but readily soluble in alcohol. It is given as an antipyretic and analgesic in doses of 0.5 to 1.0 Gm.

*Ferrisol* is the name given to a compound stated to consist of cinnamic acid and guaiacol. The dose is given as being 15 to 45 grains per day.

*Flavoidine* is the name given to a quinoline derivative having marked antipyretic and antiseptic properties.

*Formosal* is the name given to a condensation product of formaldehyde and salicylic acid, which is described as a "methylene disalicylic acid." It occurs as a tasteless white powder, melting at 245° C., very soluble in ether and alcohol, but only slightly soluble in chloroform, and insoluble in water or benzol. It is marketed by the patentees in combination with various bases, all of which have been patented, and these are designated by the prefix of the name, or part of the name, of the basic constituent—as, for instance, "bariformosal," "ammonformosal," "cupriformosal," "bisformosal," "zincformosal," etc. These different salts are recommended as valuable in gastro-intestinal disease, and in the uric acid diathesis, according to the therapeutic nature of the the basic constituent.

*Gabaniol* is the name given to a product obtained from slate, which

occurs as an oily fluid, dark brown with greenish fluorescence, and is recommended for the treatment of throat and lung troubles in doses of 4 grains administered in the form of capsules.

*Gallogene* is the name given to ellagic acid from dividivi, and is introduced as an intestinal astringent. It is quite tasteless, and, being insoluble in acid and neutral liquids, does not exert any action on the stomach, the astringent property only being developed in the alkaline secretion of the intestines. It is stated to be superior to tannigen, tannalbin, tannocol, and similar preparations, since it consists wholly of astringent matter, whereas these bodies contain but 50 to 80 per cent. of tannin. The dose of gallogene is from 45 to 75 grains per diem for adults, or 4 to 8 grains for children.—Pharm. Zeit., *47*, 580.

*Gonosan* is the name given to capsules containing 0.3 Gm. of a 20 per cent. solution of the resins of kava-kava in oil of sandal wood. Two capsules, taken four times daily, are recommended in the treatment of gonorrhœa.

*Guaialin* is the name given to the benzoic acid ester of methylene-diguaiacol. It is obtained by passing gaseous formic aldehyde through a heated mixture of benzoic acid, guaiacol and phosphorus oxychloride, and occurs as in form of an amorphous powder, of a pea-green color, containing 60 per cent. of guaiacol, 30 per cent. of benzoic acid, and 7 per cent of formaldehyde. It is recommended as an antipyretic and alterative tonic in tuberculosis.

*Hæmolin* is the name given to a preparation of malt and oxyhæmoglobin, which is claimed to contain, in addition to the active principles of malt, three times the amount of the activity of hæmatogen.

*Hæmostatin* is the name given to a "tribrom phenol bismuth," which is recommended as a hæmostatic, and must not be confounded with

*Hemostatin*, which is the name given to a preparation described as being a solution of the crystallized chloride of the active constituent of the suprarenal gland.

*Helmitol* is the name given to a formaldehyde compound, recommended as an improvement on hexamethyltetramin, which is said to be the *methylenecitrate of hexamethyltetramin*. The dose of this new compound is 1 Gm. two or three times daily.—Apoth. Ztg., 1903, 43.

*Hermophenyl* (see Proceedings 1902, 795) has been used by Hallopeau with good results in syphilis. It was given by the mouth in doses of 1 grain per day, or by intra-muscular injection of ⅔ grain in aqueous solution; local applications, 1 or 2 per cent., are also employed. By its means it is possible to introduce relatively large doses of mercury into the muscles without provoking pain, which is not the case with other soluble preparations of the metal. It may be given by the mouth without causing

digestive disturbance, and may be applied locally without giving rise to pain or irritation.—Quart. Med. Journ., 9, 84.

*Hetol-Caffeine* is the name given to a mixture of caffeine and sodium cinnamate, or "hetol" (see Proceedings 1901, 635), obtained by dissolving the two substances in water and evaporating to dryness. It is supplied in the form of an odorless, but bitter powder, having an alkaline reaction. It is soluble in twice its weight of water, and recommended as being more efficient than caffeine-sodium salicylate as a diuretic.

*Hygiama* is the name given to a concentrated food, which is claimed to be easily digested and particularly suited for children. It is said to contain, in addition to a considerable amount of proteid and mineral matter 10 per cent. of fats and 49 per cent. of soluble carbohydrates.

*Ichthargan* is the name given to a silver salt of ichthyol. It is described by H. Helbing and F. W. Passmore as being a brown amorphous powder, without odor and unchanged by exposure to the air. It is readily soluble in water, forming a clear brown solution, which darkens by exposure to light, but does not deposit. It also dissolves in dilute alcohol and in glycerin, but is insoluble in absolute alcohol, in ether, and in chloroform. An analysis of the brown powder gave: Silver, 28.7 per cent., and sulphur, 12.1 per cent. Notwithstanding the large proportion of silver and of sulphur in the preparation, its aqueous solution gave no precipitate, nor even darkened, on addition of ammonia or caustic alkalies; carbonates produced a whitish turbidity. Sodium chloride solution produced a turbidity in a dilute solution of ichthargan, and a precipitate of silver chloride in a concentrated solution; but it was evident that the organic acid possessed a great restraining influence on the precipitation of silver chloride, and neither with a large excess of silver chloride nor even with free hydrochloric acid could the whole of the metal be precipitated from solution. Albumen also produced a precipitate in ichthargan solutions, soluble in excess of albumen. Ichthargan possesses antiseptic and antiputrefactive value. A ½-per-cent. ichthargan solution prevented decomposition of urine and of casein solution maintained at blood temperature, control specimens of which became highly putrefactive in forty-eight hours. The same authors have also examined

*Ichthoform*, a compound of ichthyol and formaldehyde. This is a brown amorphous powder, insoluble in water, alcohol, and glycerin. By dilute alkalies it is gradually dissociated, with elimination of formic aldehyde and ichthyol. It has a slight aromatic odor, and is without taste, producing none of the irritant effects of formic aldehyde upon the mucous membranes of the nose and throat. If ichthoform powder is dusted upon the surface of any putrefactive liquid or flesh, it arrests decomposition and also acts as a deodorant. As ichthoform is itself insoluble in ordinary solvent media, it is evident that the antiseptic and deodorant effect must

be due to a gradual dissociation into ichthyol and formic aldehyde, such as is brought about, for instance, by dilute alkalies.—Chem. & Drug., Dec. 27, 1902, 1055.

*Ichthyolodin* is the name given to the piperazin salt of ichthyol-sulphonic acid, recommended, in form of tablets containing 0.25 Gm., in the treatment of gout and the uric acid diathesis. It is insoluble in water, but soluble in alkaline solutions.

*Ichthyolsalicyl* is the name given to an ichthyol mixture containing various quantities—from 25 to 50 per cent. of sodium salicylate. It is recommended both for external application, in combination with dermosapol, and internally—the dose of the 50 per cent. preparation being 0.2 Gm., given in combination with citrated caffeine, and some suitable diuretic diluent, in form of pills, such being recommended in arthritis, diabetes, and in pulmonary tuberculosis.—Pharm. Centralh., 1902, 629.

*Iodalgine* is the name given to a compound containing 50 per cent. of iodine, with which it readily parts in contact with the tissues, liberating it in the nascent state. While possessing powerful antiseptic properties, it is claimed to be without the caustic effect of iodoform, and free from disagreeable odor. It may also be used internally in daily doses of 0.4 to 0.5 Gm.

*Iodo-serum* is the name given to a solution of 6 parts of sodium chloride and 2 parts of potassium iodide in 1000 parts of water, recommended in syphilitic affections, and, as a sedative, in mental disorders, for hypodermatic injections.

*Isarol*—formerly called "ichthyodin," is a Swiss substitute for "ichthyol"—and is said to correspond to all the requirements of the Pharm. Helv. for *ammonium sulfoichthyolicum*.—Amer. Jour., Dec., 1902, 603.

*Jecorin* is the name given to a cod-liver oil substitute, containing: chlorhydro-phosphoric acid and calcium lactophosphate, of each, 0.5; lactic acid, 0.25; phosphoric acid, 3.0; iodine, 0.5; ferrous iodide, 0.375; compound extract of wormwood, 5; with sufficient vegetable extraction to make 100 parts.—Œst. Zeitschr. f. Pharm., 1903, 823.

*Koryzaphylla* is the trade name for a paper handkerchief intended for the use of patients suffering from pulmonary tuberculosis, grippe, or any other affection of the mucous surfaces of the nose or throat—the handkerchief being destroyed by burning after use.—Amer. Journ. Pharm., Sept., 1902, 443.

*Kreiamine* is the name given to an aqueous solution of tricresol and ethylenamine, recommended for inhalations, by means of a nebulizer, in the treatment of whooping-cough, bronchitis and tuberculosis, and externally in the treatment of certain skin diseases.

*Kreso* is the name given to a product marketed by an American firm

which is said to be a solution of the cresols and higher phenols, forming a dark-brown alkaline liquid. When mixed with water, it forms an emulsion, but forms clear solutions with alcohol, ether and chloroform. It is recommended as a disinfectant and deodorant.

*Kryogenin* is the name given by Lumiere to "metabenzamiodo carbazide." It is a white powder, odorless, somewhat bitter, but not unpleasant to the taste, soluble in 40 parts of water, and readily soluble in the other solvents. It is purely and energetically antithermic and antipyretic in its action, but free from analgesic, hypnotic, or decided toxic action, and is recommended as superior to the commonly employed antipyretics for the treatment of tuberculous patients. The dose ranges from 1½ to 10 grains; but the daily dose should not exceed 17 Gm.—Pharm. Post, 1903, 7.

*Lactocolle* is the name given to a light, white, inodorous and tasteless powder, easily soluble in water and making a solution comparable in appearance to the white of egg. It is a nearly absolutely pure form of caseine, and is used with advantage in the classification of wines, alcoholic liquors, and the like.

*Lenigallol—A Useful Application in Skin Diseases.*—W. N. Clemm recommends the use of lenigallol, made into a 20 per cent. paste with starch and vasoval (? Rep.) in the treatment of eczema following scrofula and rachitis, allowing the application to remain *in situ* for several days. It may also be applied to the surface in form of powder, covering the affected surface afterwards with protective strappings.—Pharm. Journ., April 11, 1903, 526; from B. M. J. Epit., 1, 1903, 4.

*Libanol Boisse* is the name given to the volatile oil of the Atlas cedar (*Cedrus atlantica*, Manetti), which has been described under "Volatile Oils" in the Report of 1901 (815), and is again mentioned in that chapter of the present Report.

*Lofotal* is the trade name of cod-liver oil impregnated with carbonic acid. It is claimed that the disagreeable taste of the oil is so changed by the carbon dioxide that the resulting preparation is as pleasant and palatable as aerated water. It is furthermore claimed that the presence of carbon dioxide effectually prevents oxidation of the oil.—Ztschr. Oest. Apoth. Ver., 1903, 225.

*Lomol* is the name given to a preparation which is claimed by the manufacturer to be a product of the desiccation of muscular juices.

*Lygosin* (see Proceedings 1901, 638) is prepared, according to "Pharm. Post" (1903, 101), by reaction between salicylic aldehyde and acetone in presence of a strong solution of sodium hydroxide. The sodium lygosinate produced may be recrystallized from 60 per cent. alcohol, and so obtained forms green metallic glistening prisms, which, when incinerated, should leave as residue 24.3 per cent. of sodium carbonate.

*Lygosinate of Sodium* is claimed to have strong antiseptic and antifermentative properties, and to be devoid of corrosive action.

*Mesotan* is the name given to the *Methoxy-methyl Ester of Salicylic acid*, which is recommended as an external application for rheumatism, on account of its rapid absorption and easy saponification as compared with gaultheria oil and methyl salicylate.—Apoth.-Ztg., 1902, 739; from D. Med. Woch., 1902, 765.

*Methylatropine Bromide* is mentioned among the newer remedies as possessing certain therapeutic advantages over atropine. It is soluble both in water and in dilute alcohol. Given in doses of 0.005 to 0.010 Gm. once a day, it is said to control the night sweats of phthisis without any of the secondary effects noticeable with atropine or any of the other belladonna preparations. Two drops of a 1 per cent. solution are said to dilate the pupil when dropped into the eye, the effect of the dilation wearing off within four hours.—Apoth.-Ztg., 1903, 42.

*Microcidin* is the name given by Belioz to "sodium naphtolate," which may be prepared as follows: Mix 40 parts of 30 per cent. liquid caustic soda with 40 parts of distilled water, dissolve 25 parts of $\beta$-naphtol in the mixture by the aid of heat, and evaporate to dryness. The resulting powder is white or nearly white, freely soluble in water, and is considered by Belioz to be a powerful antiseptic. It is said to be used in solutions of 3 to 5 parts in 1000.—Amer. Jour. Pharm., Sept., 1902, 444.

*Microsol* is the name given to an antiseptic in the form of a bluish-green paste, which is said to be composed of 10 parts of copper phenol-sulphate; 75 parts of copper sulphate; 2.3 parts of sulphuric acid, and 12 parts of water.

*Mirmol* is the name given by Ranelleti to a clear, colorless neutral liquid containing 10 per cent. of formaldehyde and 0.3 per cent. phenol, which is employed as a hæmostatic disinfectant and hardening agent for morbid growths, and also as a general disinfectant. It is applied first as a wash to ulcerated or cancerous surfaces in the form of a 0.5 or 2 per mille dilution in water, then absorbent wool moistened with a 1.9 solution of mirmol is placed over the surface, and the whole covered with another layer of wool moistened with mirmol, and a piece of gutta tissue is placed on top. It is renewed after twenty-four hours. The treatment has proven useful in carcinoma of the buccal cavity, of the female generative organs, in lupus, and similar affections.—Therap. Monats., *17*, 155.

*Myogen* is the name given to a new albumen preparation derived from the blood serum of freshly slaughtered oxen, and is recommended as a nutrient in wasting disorders. It is supplied in form of an impalpable grey powder, odorless, and tasting somewhat like glue.

*Narcotile* is the name given to the bichloride of methyl-ethylene, which by T. Eastham is said to be obtained by the direct action of hydrochloric

acid on mixed ethylic and methylic alcohols distilled together. The vapors are condensed under pressure and purified. The liquid is transparent, and highly volatile, undecomposed by light, inflammable, and agreeably odorous. The general effects of anæsthesia produced by narcotile resemble those produced by ether. It has been used with success and perfect safety in a number of different operations of varying seriousness.—Lancet, 164, 1092.

*Nicoticin* is the name given to a remedy introduced for combating the morphine habit, which has been found to consist of a liquid extract of cinchona containing besides salicylic acid, also *morphine*—in the proportion of from 2 to 4 per cent.—Pharm. Ztg., 1902, 876.

*Nori* is the name of a Japanese food which is said to consist of a sea alga, *Porphyra lacinata*. It occurs in the form of greenish, paper-like sheets, which are insoluble in water, and tasteless.

*Orexine Tannate—Reliable as a Preventive in Seasickness.*—V. Wild finds that the administration of 7½ grains of orexine tannate, taken in half a pint of any fluid, three hours before embarking, and two hours after a full meal, is a reliable preventative of seasickness. It is important that the drug should be taken precisely as prescribed, two hours after a plentiful repast, otherwise the results are not satisfactory, although actual vomiting may not occur.—B. M. J. Epit., 96, 2, 1902.

*Pancreone* is the name given to a substance obtained by the action of tannin on pancreatin, and is said to be capable of resisting the action of the gastric juice, becoming active, however, in the alkaline fluids of the intestines. It is supplied in form of a reddish-grey powder, nearly or quite tasteless, insoluble in water or dilute acids, but freely soluble in faintly alkaline media, and is administered in doses of 0.10 to 0.50 Gm., either in form of powder, cachets or tablets.—Amer. Jour. Pharm., Sept., 1902, 444; from Muench. Med. Woch., 1902.

*Pegnin.* The method of using this proprietary product has been modified by Siegert as follows: Cows' milk is boiled, cooled, and placed in a bottle; to every 200 Gm. as much pegnin as will go on the point of a knife is then added, and the bottle placed in warm water at 40° C. In a few minutes coagulation is complete. The bottle is then well shaken until flocks of coagulated casein are scarcely visible. Milk thus treated becomes remarkably digestible, and is a valuable food, not only for infants, but also for adults suffering from gastric disorders, which prevent them from digesting ordinary cow's milk.—Pharm. Journ., Dec. 3, 1903, 13; from Bull. gén. de Thérap., 114, 24.

*Petrosulfol* is an Austrian substitute for "ichthyol," which is claimed to correspond to all the requirements of the Swiss Pharmacopœia for *ammonium sulfoichthyolicum*. It is said to be obtained from the same base and identical with "isarol," which see.

*Phenosalyl* is prepared according to Cambe by the following formula: Carbolic acid, crystals, 60 Gm.; lactic acid, 5 Gm.; salicylic acid, 5 Gm.; borax, 8 Gm.; menthol, 1 Gm.; eucalyptol, 1 Gm.; thymol, 1 Gm.; glycerin, 20 Cc. The borax is dissolved in the glycerin by the aid of heat, the acids are added to the warm solution, and the menthol, eucalyptol and thymol after cooling.—Amer. Journ. Pharm., Dec., 1902, 604; from Rép. de Pharm., No. 8, 1902.

*Plesiol* is the name given to a substance which agrees in its chemical nature and physical properties with ammonium sulphichthyolate.

*Porodor* is the name given to a succedaneum to the well-known menthol pencils, of which Laquer declares that it is superior in every way, especially in neuralgias. It consists of a sponge saturated with a 3 per cent. alcoholic solution of menthol, and enclosed in a tight metallic box or holder. It needs only the slightest pressure to make it effective, and acts with promptness and energy.

*Pulmin* is the name given to a compound of creosote and formaldehyde, corresponding to "pulmoform," a compound obtained from guaiacol (see Proceedings, 1901, 641). It is described as a yellow, odorless and tasteless powder, and may be given in the same doses as pulmoform (0.5 to 1.0 Gm. four or five times a day).—Amer. Journ. Pharm., Sept., 1902, 441.

*Puronal* is the name given to a compound of bismuth oxyiodide with antifebrin, containing 2.4 per cent. of bismuth oxyiodide and 97.6 per cent. of antifebrin. It is given internally to check fermentative action, and applied externally as a dressing to ulcerous sores.—Pharm. Post, *25* (1902), 604.

*Robuston* is the name given to a dry malt extract in which diastasic extract of malt, obtained at about 60° C., is sterilized, mixed first with water, evaporated down to the condition of a solid extract, and then mixed with sterilized milk in vacuo.

*Rodagene* is the name given to a powder containing the solid constituents of goat's milk, derived from animals whose thyroid glands have been removed. It contains in addition to the solid constituents named an equal weight of milk-sugar, and is given as a diet in daily doses of 75 to 150 Gm. in the treatment of Basedow's disease, for which the special kind of goat's milk has been found most efficacious.—Journ. Pharm. d'Anvers, *58*, 417; Pharm. Journ., June 27, 1903, 872.

*Salochinin* is the salicylate of the salicylic-acid-ester of quinine, recommended as a tasteless substitute for quinine. The active dose is claimed to be from 1.00 to 3.00 Gm. daily.—Amer. Jour. Pharm., Sept., 1902, 445.

*Salocreol* is the name given to a remedy recommended as an external application in cases of facial neuralgia, rheumatism, lymphadenitis, and other affections of an inflammatory nature. It is said to be composed of the active ingredients (? Rep.) of creosote and salicylic acid, and is sup-

plied in form of a brown, oily, nearly odorless fluid, which is almost insoluble in water, but readily soluble in alcohol, ether and chloroform.—Amer. Jour. Pharm., June, 1903, 287; from Pharm. Post, 1903, 174.

*Sanosin* is the name given to a remedy in the treatment of tuberculosis, and is described as being composed of flowers of sulphur, powdered charcoal, and pulverized eucalyptus leaves, the whole being impregnated with oil of eucalyptus. It is supplied in sealed glass tubes, each containing 2 Gm., the contents of a tube being poured upon an earthenware plate heated by an alcohol lamp, and the fumes inhaled.

*Santheose* is the name given by Dr. Huchard to a theobromine of French manufacture. The author prefers to use this preparation as he has never observed any by-effects to follow its use. The dose is stated to be from 1 to 2 Gm. per day, in cachets containing 0.5 Gm. each. The author also makes use of the phosphated santheose (a combination of 0.25 Gm. sodium phosphate with 0.5 Gm. of santheose), as well as the litheated santheose (0.25 Gm. lithium carbonate, 0.5 Gm. of santheose). The latter is indicated in uremia. The author points out that caffeine may also be combined with the santheose where it is desired to increase cardiac energy.—Merck's Rep., June, 1903, 165; from Réport de Pharm., 1903, 164.

*Servatol Soap* is a proprietary soap recommended for disinfecting the hands, which is stated to contain 1 per cent. of silver cyanate in a neutral soap basis.

*Servatol Marble Soap*, introduced for the same purpose, contains 2 per cent. of silver cyanate, and also 55 per cent. of finely powdered marble with the same soap basis.—Pharm. Ztg., 1902, 938.

*Somnoform* is the name given to a preparation composed of 60 parts of ethyl chloride, 25 parts of methyl chloride, and 5 parts of ethyl bromide. T. P. C. Kirkpatrick's experience corroborates the statements of Rolland and Robinson to the effect that "somnoform" is a rapid, safe and easily-eliminated anæsthetic for use in dentistry. From observations on 207 cases Kirkpatrick finds that the average time of administration is fifty-five seconds, the average length of anæsthesia sixty-five seconds, and the average quantity of somnoform used is 4.5 Cc. No fatalities from the use of the anæsthetic seem yet to have been recorded.—Med. Press, *126*, 399.

*Sublamin* is the name given to mercury-ethylene-diamine sulphate. D. Engels finds that it forms an excellent agent for disinfecting the hands. In 2 or 3 per cent. aqueous solution it occasions no irritation, penetrates the skin, and kills all germs. Nickel-plated instruments are not affected by it. It is even more efficacious in alcoholic solution, a 2 per mille solution being the most useful strength for the purpose. Although it is only one-tenth as poisonous as corrosive sublimate, it is a better antiseptic. Ethylene-diamine, like ammonia, has the property of softening and dissolving the skin tissues. It is to this that the penetrative power of sublamin is due.

In this respect it is much superior to corrosive sublimate solution, which it should entirely replace for disinfecting the hands.—Pediat., *15*, 116.

*Sucramine*, a new trade-named sweetening agent, has been the subject of investigation by Bellier, who finds it to be very soluble in water, slightly soluble in alcohol, but completely insoluble in ether, acetone and benzin, is neutral in reaction and leaves no residue after combustion in air. On boiling an aqueous solution of sucramine with magnesia, considerable ammonia is formed; this, in connection with other physical characteristics, leads the author to believe that sucramine is an ammoniacal salt of benzoic sulphamid and identical with saccharin.—Amer. Journ. Pharm., Sept., 1902, 446; from Bull. Gen. de Therap.

*Sulphhydral* is the name given to a preparation, believed to be mainly calcium sulphide, which is claimed to be a prophylactic and a cure-all for a long list of diseases.

*Sulpho-guaiacin* is the name given to quinine sulpho-guaiacolate, which has been introduced as a remedy for bronchitis and tuberculosis. It occurs in minute, yellow, bitter scales, which are soluble in water and in alcohol. Sulpho-guaiacolic acid is first prepared by heating together equal parts of guaiacol and $H_2SO_4$. This is then neutralized with $BaCO_3$, the mixture heated to drive off $CO_2$, filtered, and the soluble barium salt decomposed with a solution of quinine sulphate. After removing the precipitated $BaSO_4$ sulpho-guaiacin is obtained in a crystalline form from the concentrated solution.—Pharm. Centralh., *44*, 79.

*Suprarenalin* is the name given by an American to the active principal of the suprarenal gland, and is supplied in form of fine crystalline powder, easily soluble in acid and alkaline solutions, but difficultly soluble in water, alcohol, or ether. It is doubtless akin to the

*Suprarenin* noticed in a previous report (see Proceedings, 1901, 644), which, as now supplied by a German firm, is stated to be a sterilized solution (1 : 1000) of suprarenin hydrochloride—a body probably identical with "adrenalin hydrochloride" (see Proceedings, 1902, 1083).

*Tachiol*, which consists of fluoride of silver and has been introduced as a germicide, has been the subject of experiments by Dr. G. Perez. Both in its power of arresting development of different bacteria, and of killing them, the substance is said to be greatly superior to carbolic acid, and only slightly inferior to corrosive sublimate (strength for strength of solution), and it is the most potent of all salts of silver in these reports. Tachiol is non-toxic and of a non-irritating character, and has been given extensive and successful trials as an antiseptic in surgical and ophthalmic practice.—Pharm. Journ., Dec. 3, 1903, 13; from Il Policlinico, Sez., Chir., 10, 1902, through Lancet.

*Theocin—A New Synthetic Product Identical with Theophylline.*—The name of theocin is given by Bayer & Co., to a synthetic substance, pre-

pared under a German patent, which is identical with theophylline, one of the alkaloids of tea. The process of its manufacture is quite complicated, the substances used in the synthesis being ammonia, carbon dioxide, potassium cyanide, acetic and formic acids, these being employed in the several distinct stages of the process. Theocin has been used with good results as a diuretic in cases in which other diuretics have proved inefficient or useless.—Pharm. Centralh., 1902, 604.

*Thigenol* is the name given to one of the many substitutes for ichthyol, over which the advantage is claimed that it is readily soluble in water, dilute alcohol, and slightly alkaline solution. It is the sodium salt of a sulfonic acid obtained from a sulphur containing oil, and is decomposed by mineral acids and by acetic acid, liberating the combined sulfonic acid, of which it contains about 35 per cent. In dermatological practice it may be prescribed, either in the form of ointments or of aqueous solutions. The former, containing 20 per cent. of thigenol, form on the skin a bright, brown, slightly adhesive pellicle which may easily be removed by washing with tepid water. It is odorless, and its stains on linen are easily washed out.—Pharm. Journ., Feb. 21, 1903, 238; from L'Union Pharm., *43*, 106.

*Thymol Urethanate* is a new anthelmintic which has recently been much lauded. It is supplied in the form of white crystals which have very little taste or odor. Its use depends on its decomposition in the system, the thymol set free exercising its anthelmintic effect on the whole intestines. It is claimed to be a certain destroyer of intestinal worms of all classes, and to be free from danger.

*Tuberculo-Albumin* is the name given to a remedy for tuberculosis which is claimed to be a bacteriological product. It comes in little glass flasks, with glass stoppers, each flask containing 10 Gm., with directions to take doses of 10 to 15 drops several times daily.

*Ulmaren* is the name given by Bourcet to a mixture of the salicylic-acid esters of the higher aliphatic alcohols. It has been stated to contain 75 per cent. of salicylic acid. Ulmaren is described as a heavy, pale yellowish-red, refringent neutral, or weakly-acid liquid, of pleasant, faint odor, and burning taste. Its sp. gr. at 15° C. is 1.06; and its boiling point lies between 147° and 152°. It crystallizes from an equal volume benzin, and is almost insoluble in water, but is soluble in alcohol, ether and chloroform. The substance has been employed in articular rheumatism and similar affections; it is stated to be quite rapidly absorbed by the skin, and it is used like methyl salicylate by being painted upon the skin.—Pharm. Centralh., 1902, 403.

*Urasol* is the name given to a condensation product of acetic and salicylic acid and formaldehyde, which is supplied in form of a micro-crystalline powder, insoluble in water, soluble in alcohol and in ether. It is

recommended as a uric acid solvent and in the treatment of muscular rheumatism and gout, the dose being 5 to 8 grains.

*Uropusin* is the name given to compressed tablets prepared from the dry extract of mullein leaves, of which each of the tablets contains 0.25 Gm.

*Valerodromine* is the name given to a soluble crystalline substance which is said to be compound sodium bromide and valerianate, and is recommended as a substitute for the bromides.

*Velvril* is the name given to a cellular derivative recommended and used as a dressing for wounds. It produces a transparent film, slightly yellow in color, absolutely impermeable to all gases and fluids, tough, elastic and durable. It can easily be sterilized by any of the ordinary methods, and can be immersed in boiling water for a long time without undergoing any permanent change. It can also be easily dissolved in acetone, and the solution is quite unirritating even when in contact with a freshly made wound. Dr. P. T. B. Beale, in an experience covering a year, found its use uniformly successful, all acute inflammatory conditions seeming to abate rapidly under the influence of the substance.—Lancet, *164*, iii, 167; Pharm. Jour., Feb. 28, 1903, 266.

*Veronal* is the name given to a new hypnotic, which is said to be "diethyl-malonyl-urea." It occurs in colorless crystals (m. p. about 191° C.) having a slightly bitter taste, and soluble in 12 parts of boiling water, but requiring 145 parts at the ordinary temperature. It is given for insomnia in doses of 0.3 to 0.5 Gm., preferably dissolved in warm liquids, and is said to equal sulfonal as a soporific.—Apoth. Ztg., 1903, 195.

*Viro* is the name given to a remedy put on the German market, for the treatment of specific affections of the mucous membranes, particularly gonorrhœa and whites. The remedy consists of two collapsible tubes—one containing a 20 per cent. protargol glycerin jelly, while the other and larger one contains a 5 per cent. lysoform-soap-crème—the two sufficient for a treatment.

*Volesan* is the name of a mixture, dispensed in gelatin capsules, which are composed of creosote carbonate, 0.3 Gm.; heroin, 0.0025 Gm.; balsam of tolu, 0.25 Gm.; camphor, 0.065 Gm. The remedy is recommended for the treatment of phthisis and other diseases of the respiratory organs.

"*Wuk*" is the name given to a vegetable nutritive extract, introduced as a substitute for meat extract. According to Enoch it contains 22.9 per cent. of water, 24.79 per cent. of ash, and 52.27 per cent. of organic matter. The ash contains NaCl 10.8 and $P_2O_5$ 7.35, calculated on the original extract. The organic matter yields 6.26 per cent. of nitrogen, equivalent to 39.11 per cent. of albuminoids; 88.6 per cent. of the extract is soluble in alcohol, whereas meat extract does not give more than 58 per

cent. of matter soluble in that liquid. "Wuk" gives a clear solution with water, and has a very pleasant odor and taste.—Pharm. Post, *25* (1902), 604.

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# MATERIA MEDICA.

## A. Vegetable Drugs.

### GENERAL SUBJECTS.

*Vegetable Drugs—Modified Scheme for their Proximate Analysis.*—Burt V. Nelson, after making comparative trials with the methods of Dragendorff and Parsons on a number of drugs, viz., cascara sagrada, hydrastis, belladonna leaves, hyoscyamus, nux vomica and strophanthus, has been led to believe that with the exception of seeds or other organs unusually rich in fat or waxy matters, and in cases where the volatile matters are to be determined in the indirect way after the method of Dragendorff, much more satisfactory results may be reached with a method which he describes in the Proceedings of the N. Y. State Pharmaceutical Association, 1902. It is impracticable to reproduce this in condensed abstract.

*Powdered Drugs—Analytical Scheme for their Microscopical Examination.*—Burt E. Nelson continues the series of papers (begun in Merck's Report, July, 1900 [see Proceedings, 1901, 652] and continued since then in monthly installments) giving the details of an analytical scheme for the microscopical examination of powdered drugs. The current series covers the following drug powders: *Cyprepedium, Caulophyllum, Veratrum viride* (July, 1902, 264, 265); *Veratrum album, Ipecacuanha, Phytolacca, Sarsaparilla* (Aug., 1902, 299–301); *Gelsemium, Glycyrrhiza, Calamus, Spigelia* (Sept., 1902, 345, 346); *Iris versicolor, Iris florentina, Calumba* (Dec., 1902, 461, 462); *Lappa, Inula, Arnica radix, Taraxacum* (March, 1903, 66, 67); *Cichorium, Pyrethrum, Gentian* (May, 1903, 128); *Senega, Triticum.* The author concludes the present series by giving a color classification of the root, rhizome and tuber powders that have been heretofore considered in his "analytical scheme," allowing for the shade variations which are prone to result from irregularities in the drying process. In using it, the color of a vial of the unknown powder is matched with the color of one of the test vials, after which the more specific characters are looked for.—Merck's Rep., June, 1903, 157, 158.

*Vegetable Powders—Diagnostic Characters.*—In further continuation of their previous series of papers on the diagnostic character of vegetable powders (see Proceedings, 1901, 652 and 1902, 810), Prof. Henry G. Greenish and Eugene Collins have contributed the following during the year (from July 1, 1902, to June 30, 1903); these papers, as were the

previous ones, being illustrated with excellent cuts displaying the histological features that characterize the powder under consideration, and published in the "Pharmaceutical Journal" on the dates below mentioned:

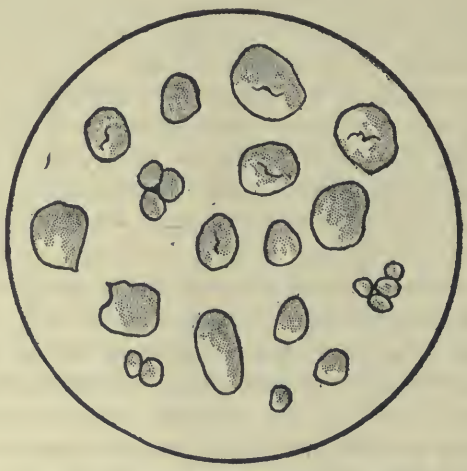
*Powdered Seeds and Fruits:* Areca nuts; cacao seeds; on July 26, 1902 (71–73); ignatius beans; linseed; black mustard seed; white mustard seed; nutmegs; nux vomica; on October 25, 1902 (416–419); colchicum seeds; mace; foenugreek seeds; stavesacre seeds; on November 29, 1902 (554–556); anise fruits; caraway seeds; cummin fruits; fennel fruits; colocynth fruits; cardamom fruits; cubeb fruits; pimento fruits; black pepper fruits; on December 27, 1902 (698–701).

*Powdered Woods:* Guaiacum wood; Jamaica quassia wood; red sanders wood; yellow sandal wood; on February 28, 1903 (276–278).

*Powdered Barks:* Alder buckthorn bark; cascara sagrada bark; cascarilla bark; on May 23, 1903 (703–705); cassia bark; cinchona bark (Ledger); cinnamon bark; cusparia bark; on June 20, 1903 (843–845); oak bark; pomegranate root-bark; quillaya bark; on June 27, 1903 (871–872).

*Official Barks—Characteristics of their Starch Content.*—Thomas S. Brown describes the microchemical tests applied by him for determining the characteristics by which the starches in the following official barks may be distinguished and differentiated: Blackberry, buckthorn, butternut, cas-

FIG. 35.

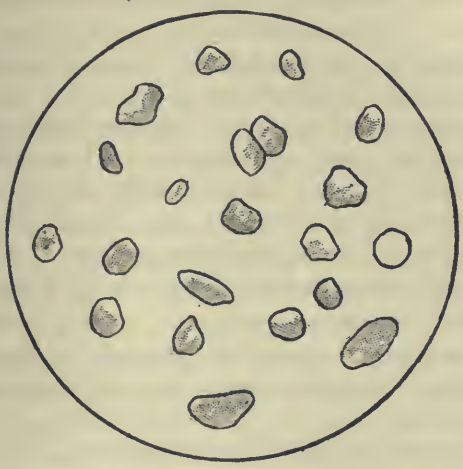


Starch Granules of Saigon Cinnamon.

cara sagrada, cascarilla, cassia cinnamon, Ceylon cinnamon, cinchona calisaya, cinchona succirubra, cotton root, euonymus, mezereum, pomegranate, prunus virginiana, quebracho, saigon cinnamon, sassafras, soap (quillaja), viburnum opulus, viburnum prunifolium, white oak and xanth-

oxylum. He gives a brief description of the general characteristics of the starch in these barks, and shows them in excellent illustrations, three of which—selected from the different groups into which the author has been able to divide them—being shown here by Figs. 35, 36 and 37. The

FIG. 36.



Starch Granules of Cinchona Succirubra.

FIG. 37.

Starch Granules of Cotton Root Bark.

paper is concluded with a very brief synopsis of the character of the starch granules in general, grouped as follows:

*A. Granules simple, bounded by rounded surfaces.*

I. Hilum central.

*a*. Granules circular.

1. Hilum star-shaped and distinct, granules 2.17 to 10.8 mikra in diameter. *Euonymus.*

*b.* Granules circular, oval or elongated.

1. Oval granules about 5.4 mikra in size with a filiform, indistinct hilum, among smaller rounded granules with no hilum. *Buckthorn.*

2. Elongated and roundish granules with a star-shaped hilum, 8.1 to 13.5 mikra in size. *Viburnum opulus.*

3. Oval and round granules, with large hilum, mostly star-shaped; granules 5.4 to 21.6 mikra. *Viburnum prunifolium.*

4. Oval to circular granules. Hilum indistinct, generally only a dot, or at the most a faint line; size 5.4 to 27 mikra. *Prunus Virginiana.*

5. Oval or roundish granules, hilum indistinct and filiform, present only in the largest forms; size 10.8 to 18.9 mikra. *Saigon Cinnamon.*

6. Elongated granules among small rounded forms. Hilum small and filiform, present in larger granules only; size 2.7 to 8.1 mikra. *Quebracho.*

II. Hilum eccentric, oval or elongated.

1. Granules broadly oval, round or elongated. Hilum star-shaped or filiform or curved, only seldom present in center of granule; size 8.1 to 16.2 mikra. *Mezereum.*

2. Granules narrowly elongated or round, hilum a dot at one end and very faint. Abundant tissue starch present; size of larger 8.1 to 10.8 mikra; smaller, about 2.7 mikra. *Cascarilla.*

3. Granules round, oval or elliptical. Hilum a dot or faint line, present only in largest forms. Small roundish granules abundant. Size 5.4 to 18.9 mikra. *Ceylon Cinnamon.*

4. Granules mostly roundish. Hilum, when present, only a dot. Size 5 to 13.5 mikra. Predominating form about 8.1 mikra in diameter. *Cinchona succirubra.*

*B. Granules simple, hilum not present.*

I. Granules rounded.

1. Granules mostly round, with depressed center and wave-like margin; size 8.1 to 18.9 mikra. *Xanthoxylum.*

2. Granules round and in masses; size 2.7 to 5.4 mikra. *Cascara sagrada.*

3. Granules roundish or slightly angular and single; size 5.4 to 10.8 mikra. *Butternut.*

II. Granules elongated, with few slightly rounded forms.

1. Granules mostly elongated, margin very uniform; size 5.4 to 10.4 mikra. *Pomegranate.*

2. Granules more round than above form. Occur in small groups of two or four; size 4. to 6.7 mikra. *Soap bark.*

*C. Granules simple or compound.*

I. Parts of compound granules, ranging between two and five.

1. Single granules circular, hilum eccentric and only a dot. Compound granules consist of three or four parts and are not numerous. Size 5.4 to 21.6 mikra. *Cinchona Calisaya.*

2. Simple granules elongated, with filiform eccentric hilum or central, star-shaped hilum, and showing faint concentric rings. Compound starch, composed of two to five parts, each part quite distinct and having a star-shaped hilum. Size 2.7 to 8.1 mikra. *Sassafras.*

3. Simple granules round or circular, with eccentric hilum and 2. to 18.9 mikra in size. Pear-shaped granules present, 21.6 mikra long. Compound starch of two and four parts, each part with a small filiform hilum; size of compound starch about 16.2 mikra in diameter. *Cassia Cinnamon.*

4. Simple granules round or oval, with hilum long and distinctly ragged, or often star-shaped. Compound granules of two or three parts with hilum in each part only a dot. Those of two parts consist of a large and a comparatively small granule; size, 5.4 to 13.5 mikra. *White oak bark.*

II. Parts of compound granules numbering two to five or more.

1. Simple granules, round to ovate, generally with distinct central star-shaped hilum. Compound starch, consists of two to seven parts. Those of six or seven parts have a large central depression or space, resembling a large ragged hilum. Those composed of two or three parts often are in distinct divisions, each division having a hilum; size, 2. to 18.9 mikra. *Blackberry.*

2. Simple granules round, oval or of kettle-drum shape. Hilum a dot, central. Compound starch of two to six parts and granules egg-shaped, each part in close contact, not having a central depression or space. Granules composed of three or four parts predominate. Hilum in parts only a dot when present. *Cotton root.*—Drug. Circ., Aug., 1902, 158–161.

*Seeds—Prolonged Vitality.*—J. Poisson has brought together a few instances where the facts justify the inference that seeds may retain their vitality for a period of thirty or forty years. Thus at a time when some old houses were being pulled down, some of the soil below the foundations was taken and planted in a garden. After about two months a considerable crop of *Juncus bufonius* sprang up. Again in the case of some ponds where *Carex cyperoides* was know to grow, these were filled up for some thirty years and then uncovered, when the *Carex* again made its appearance. Somewhat similar instances are given for *Coleanthis subtilis* and *Alnus*, which were found growing in spots where they had not been recorded for many years, and where there were no plants in the neighborhood from which the seeds might have been brought. Poisson regards it probable that those seeds belonging to plants which inhabit wet situations may in water be able to retain their vitality and germinating power.—Pharm. Jour., Oct. 4, 1902, 336; from Comp. rend., *135*, 333.

*Poisonous Fruits and Seeds—Concise Description of Kinds Liable to be*

*Eaten.*—Occasional requests from medical men for the identification of seeds evacuated by patients, much to the alarm of the nurse and the mystification of the doctor, has prompted Dr. E. M. Holmes, Curator of the Br. Pharmaceutical Society's Museum, to communicate a concise description, accompanied by illustrations of the seeds of the poisonous fruits most likely to be mistaken as edible and eaten. These comprise the following seeds: Black bryony (*Tamus communis*, L.); white bryony (*Bryonia dioica*, Jacq.); woody nightshade (*Solanum Dulcamara*); garden nightshade (*Solanum nigrum*, L.); belladonna (*AtropaBelladonna*); privet (*Ligustrum vulgaris*); arum (*Arum maculatum*, L.); ivy (*Hedera helix*, L.), and mezereon (*Daphne Mezereum*, L.). For the purpose of comparison, also, the seeds of a number of edible fruits are also described and illustrated. These are the following: Blackberry (*Rubus fruticosus*, L.); raspberry (*Rubus idæus*, L.); strawberry (*Fragaria elatior*); gooseberry (*Ribes grossulariæ*), and elder (*Sambucus nigra*, L.). The author's contribution is of such practical value that his concise descriptions are reproduced, and will be found under their several headings in the text of this report.—From Pharm. Jour., Jan. 3, 1903, 5–7.

*Fruit Berries—Anatomy.*—A. Winten has published an illustrated paper on the histology of the following fruit-berries: Strawberry, blackberries (*Rubus strigosus*, Mich., *R. villosus*, and *R. candensis*, L.); red currants; black currants; gooseberries (*Ribes grossularia*, L., and *R. oxyacanthoides*); cranberry (*Vaccinium macrocarpum*, Ait.); and huckleberry (*Gaylussacia resinosa*, Torr. et Gray). The illustrations show very interesting microscopical sections, which may be consulted in Ztschr. f. Unt. d. Nahr. u. Genussm., Sept. 1, 1902, 785–814.

## ALGÆ.

*Algæ—Presence of Arsenic.*—According to Gautier arsenic appears to be closely associated with iodine in the marine algæ. He finds that *Fucus vesiculosus* contains 1.59, *F. digitatus* 1.08, and *F. serratus* 0.82 part per million. It is also present in fresh-water algæ, *Spirogyra* giving 0.40 and *Cladophora* 0.08 part per million. Boghead coal, which is formed of the *debris*, chiefly the spores of fresh-water algæ, is found to be very rich in arsenic. Boghead coal from Lorme contained 20 to 25 parts per million, and Australian boghead 3.0 parts per million. It has since been found by the author in all algæ, including those which occur in sulphurous springs. Its presence has also been demonstrated in sea-water, carefully freed from suspended organic matter by filtration through a porous porcelain filter. It is probably derived from granitic rocks, in which it is always found accompanied by iodine. It may be considered to be universally distributed in Nature, since it has been found in primitive rocks, earths, sea-water, vegetable growths, especially algæ, as well as in terrestrial and marine animals. In the latter it is confined to the organs of ectodermic origin, which are

connected with the sensitive system and reproductive functions. It appears to fulfil a function in the cells in which it occurs analogous to that of phosphorus.—Pharm. Journ., Jan. 31, 1903, 126, from Comptes rend., *135*, 835.

*Red Algæ—Method of Fixing.*—A. Hassenkampf has obtained good results by a slight variation from Von Roth's ordinary solution for fixing red *algæ*. To 500 Cc. of a saturated aqueous solution of picric acid he adds 5 Gm. platinic chloride dissolved in 5 Cc. water, 3 Cc. glacial acetic acid and 2 Gm. osmic acid. This is diluted with nine times its volume of sea water. The algæ require two to five minutes to fix, and are then washed with 70 per cent. alcohol. For staining, a very weak solution (1 : 2,000) of Kleinenberg's hæmatoxylin was found to work well. Oltmann's statement that the oöblastema, or sporogenous filaments, attach themselves to auxiliary cells merely to obtain nourishment, and that no fusion of nuclei takes place, receives full confirmation.—Pharm. Journ., July 12, 1902, 21; from Botanische Zeitung, *60*, i, 66.

*Fucus Vesiculosus—Determination of Iodine.*—From an examination of *Fucus vesiculosus*, E. Weiss confirms Eschle's statement that the iodine is present in this sea-weed in the form of an organic compound. He finds that the best method of determining the iodine consists in cautiously fusing the substances with caustic potash, adding potassium nitrate, and continuing the ignition to whiteness; dissolving the product, liberating the iodine with fuming nitric acid, shaking out the iodine by carbon disulphide, and after washing the carbon disulphide solution, titrating with thiosulphate.—Œster. Ztschr. f. Pharm.

## BACILLARIÆ.

*Bacteria—Light-Producing Kinds.*—It has been shown by H. Molish that at a certain stage in the decomposition of meat bacteria are developed which produce light strong enough to throw a shadow. The bacterium

*Micrococcus phosphorus*, tested in a dark chamber, was found to cause heliotropic curvatures in the case of seedlings of *Lepidium sativum*, *Pisum sativum* and *Papaver orientale*.—Pharm. Journ., Feb. 21, 1903, 233; from Ber. d. Kais. Akad. d. Wissensch. Wien., *111*, 141.

*Bacteria—Resistance to Heat.*—H. L. Russell and E. G. Hastings describe a micrococcus, isolated from milk, the thermal death-point of which is 76° C. for an exposure of ten minutes. As the temperature is raised to about 70° C. some of the cells begin to succumb, but a small residuum retain their vitality until 76° C. is reached. Using this organism the investigators have carried out some interesting observations upon the increased resistance of bacteria in milk, pasteurized in contact with the air. Heated in bouillon and in milk in closed vessels (sealed tubes) the thermal death-point is approximately the same, viz., 76° C., but in milk

heated in an open vessel the organism survived a temperature of 80° C. It was found that this resistance is due to the protection afforded by the membrane which forms when milk is heated while freely exposed to the air, for in samples of sterile milk which were "seeded" with the organism and heated in an open beaker to 80° C., numerous colonies were obtained from the membrane on sub-culturing, while the milk below the membrane was sterile.—Pharm. Journ., Sept. 13, 1902, 275; from Centr. f. Bakt., *8*, 339 and 462, through "Nature," *66*, 423.

*Bacterial Flagella—New Method of Staining*—Gemmelli claims to have devised a method for staining bacterial flagella which gives beautiful results, is easy to carry out, and always succeeds. Two solutions, A and B, are prepared. Solution A consists of potassium permanganate 25 centigrammes, distilled water 100 Cc.; Solution B, 20 parts of a solution of chloride of lime (0.75 Gm. in 100 Cc. distilled water), are mixed with 1 part of a solution of neutral red (1 per cent. in distilled water). Cover glasses, prepared in the ordinary way, are immersed in solution A for ten to twenty minutes, washed in distilled water, placed in solution B for fifteen to thirty minutes, and again well washed in distilled water. The duration of immersion depends upon the species of bacterium treated.—Pharm. Journ., May 23, 1903, 700; from Centralb. f. Bakt., xxxiii, 1903, 316.

*Bacterium Vasculosum—Formation of Gum in Diseased Stalk of Sugar-Cane Due to its Presence.*—See *Gum* under "Organic Chemistry."

*Bacillus Coli and B. Aerogenes—Decomposition Products of their Cultures.*—L. F. Rettger has studied the decomposition products produced by these two organisms when grown on a medium composed of infusion of meat with coagulated egg-white, incubated anaerobically in hydrogen. After two or three weeks the following products were found in cultures of *Bacillus Coli*, a large quantity of indol, much sulphuretted hydrogen, mercaptans, leucin and tyrosin, together with phenol compounds and skatol-carboxylic acid, but no albumose, peptone, cadaverin, or putrescine. After three or four weeks decomposition had proceeded further, and only indol, leucin and tyrosin remained unattacked, the other products having been decomposed with the formation of water, carbon dioxide, marsh gas, etc. The

*Bacillus lactis aerogenes* proved to be much less active than the *Bacillus coli*, a period three or four times as long being required by the former to bring about the same amount of decomposition as that needed by the latter.—Amer. Journ. of Physiol., viii, *4*, 284.

*Pseudomonas Destructans—Action of its Enzymes on the Living Turnip Cell.*—M. C. Potter gives an account of his further study of the action of the cytase and toxin, secreted by *Pseudomonas destructans*, upon the living turnip cell. He has succeeded in tracing the passage of the bacterium

into the cells through the cell-wall, the observations being made from pure cultures, under the most rigid sterile conditions, by means of the hanging drop. The action of the cytase and toxin was surprisingly rapid; the swelling of the cell-wall and contraction of the protoplasm could be observed almost immediately upon the introduction of the *Pseudomonas*. Within an hour and a half the cell was dead and its walls in an advanced stage of disintegration. The original cell was kept under observation for some days, and, after patient and continuous watching, certain of the bacteria were observed slowly forcing their way through the wall, until finally they emerged into the cell-cavity. The penetration of the wall was observed on several occasions, and numerous individuals could be seen in all stages of the process. The time required varied with the thickness of the wall, but on an average occupied about three hours. Important evidence of the perforation of the cell-wall by *P. destructans* was also afforded by the method of paraffin sections; by fixing and double staining, the cell-wall and bacteria were distinctly differentiated, the latter being shown fixed in the actual process of perforating the wall, and various stages of penetration could be distinguished. Experiments showed that the old and fully-developed cuticle is apparently proof against the action of the enzymes excreted by *P. destructans*, but this parasite can readily effect an entrance into its host through the undeveloped epidermis of young and tender structures. A comparison of the parasitism of *Botrytis cinerea*, as demonstrated by Nordhausen, presented an exact parallel.—Pharm. Journ., July 26, 1902, 65; from Nature, *66*, 238.

*Diphtheria Bacillus—New Stain.*—W. G. Schauffler employs pyronin as a stain for the diphtheria bacillus. The solutions necessary are the following: (1) Filtered solution of Löffler's methylene blue, 10 Cc.; filtered solution of pyronin, 1.5 Cc.; acid alcohol, 0.5 Cc. (2) The pyronin solution is a 5 per cent. one in distilled water. (3) The acid alcohol consists of absolute alcohol, 97 Cc., and 25 per cent. hydrochloric acid, 3 Cc. The cover-glass preparations are stained for one minute, and are then well washed, dried and mounted. The bodies of the bacilli are stained blue, the poles are a bright ruby-red.—Med. Record, Dec. 6, 1902, 895.

*Plague Bacilli—Method of Staining.*—W. J. Calvert finds that in fatal cases of plague, *bacilli* are almost always present at some period in the peripheral circulation. In staining smears the characteristic bi-polar staining of the bacilli is often not observed, unless the preparations be first treated with absolute alcohol or by Gram's method, with subsequent light staining with dilute carbol-fuchsin or methylene-blue.—Pharm. Journ., March 14, 1903, 385; from Centr. f. Bakt., Abt. Originale, xxxiii., 247.

*Tubercle Bacilli—Difference of Chemical Composition According to Source.*—De Schweinitz and Dorset have investigated the chemical composition of tubercle bacilli derived from various sources, especially in regard

to the amount of ash of phosphoric anhydride, and of the alcohol, ether, and chloroform extracts. They find that there is a distinct difference in the composition of the various bacilli; the alcoholic extract of avian bacilli is very much greater than that of any other variety, but the chloroform extract of bovine and of human virulent bacilli is almost the same. There is also a greater difference between the virulent and non-virulent human bacilli than between the virulent human, bovine and equine bacilli.—Amer. Med. Jour., July 19, 1902, 93.

FUNGI.

*Moulds—Influence of Alkaloids on their Development.*—Yasuda communicates a preliminary note on the influence of certain alkaloids on the development of some common moulds, viz., *Aspergillus niger*, *Penicillium glaucum*, *Mucor stolonifer* and *Botrytis cinerea*. The chief alkaloids experimented with were the hydrochlorides of morphine, strychnine, quinine, cocaine, cinchonine, codeine and sulphate of veratrine. Solutions of various strengths, from 0.2 per cent. to 2 per cent., were added to Richards' normal culture solution, with the following results: (1) The moulds generally grow better in the solutions which contain alkaloids than in the normal control solution. (2) The formation of chalmydospores is very common in the stronger solutions. (3) The greater the strength of the alkaloids the shorter and thinner become the conidiophores and the sporangiophores. (4) With stronger solutions the development of conidia or sporangia is entirely stopped. (5) The alkaloid having least effect on the moulds was morphine, the strongest cocaine. (6) Of the moulds experimented upon, *Penicillium* offered the greatest resistance to alkaloids, and *Mucor stolonifer* was the most sensitive.—Pharm. Journ., July 12, 1902, 21; from Bot. Magazine (Tokyo), *15*, 79, 1901.

*Aspergillus Fumigatus* and *A. Flavescens—Secretion and Isolation of a Toxin.*—Carlo Ceris and Carlo Bexta claim to have demonstrated that *Aspergillus fumigatus* and *A. flavescens* secrete a toxin which, injected into an animal, produces the same symptoms as the injection of the spores themselves. This toxin was obtained as follows: Cultures rich in spores are treated with 90 per cent. alcohol at 38° C., or with ether at 20° C., for twelve days at least. The alcohol or ethereal extract is evaporated, and leaves a waxy, fatty residue of a dirty yellow color and a peculiar aromatic odor. The toxin is dissolved from this with water. It resists boiling for fifteen minutes, and can be kept in solution in alcohol, but the aqueous solution loses its toxicity. Injected into animals, especially rabbits, it induces toxic symptoms, viz., exaggeration of the reflexes, tremor, muscular contraction, and increased frequency of the heart beat and of respiration.—Pharm. Journ., May 30, 1903, 755; from Centr. f. Allg. Pathol. u. pathol. Anat., xiii, 23, 930.

*Chinese Yeast—Botanical Position of Its Fungus.*—The complex prepa-

ration known as "Chinese yeast" has been shown by Calmette to contain a fungus which he named

*Amylomyces rouxii.*—The only reproduction of this fungus heretofore observed was endogenous spore-formation in the mycelial filaments, but recently M. J. Turguil has obtained stalked sporangiophores bearing spores. This method of reproduction brings the fungus into the genus Mucor, so that this is a Mucor which produces both an amylase and a zymase. The sporangiophores were obtained by cultures on solid media, such as carrot and cooked rice, and in one or two liquid media, of which the author mentions orange juice and bouillon.—Pharm. Journ., Feb. 7, 1903, 162; from Comptes rend., *135*, 912.

*Yeasts—Simple Method for Quantitatively Estimating the Starch Content.*—Winder recommends the following simple method for rapidly estimating the starch content in yeasts: One or two Gm. of the sample are rubbed down with 10 Cc. of water and 1 Cc. of solution of iodine; the mixture is placed in a graduated tube and centrifuged for two or three minutes, and the blue-black layer of iodide of starch read off and compared with a standard series of graduations based on the results of experiments with mixtures of yeast and potato starch of known composition.——Pharm. Journ., March 21, 1903, 418; from Ztschr. f. Unt. d. Nahr. u. Genussm., 1902, 1201.

*Dried Yeast—Preparation.*—According to Albert Buchner and Rapp, a dried yeast which retains its activity on keeping is obtained as follows: The yeast is freed from water as much as possible by expression, immersed in acetone and rubbed through a sieve. The acetone is decanted, renewed, again decanted, and the residue collected by the aid of a suction filter, then treated with ether for three minutes, and this removed in the same way, after which the yeast is spread out to dry, the drying being completed at a temperature of 45° C. By using acetone instead of alcohol the activity of the original yeast remains unimpaired. Dried yeast, so obtained, is an almost white powder.—Pharm. Centralh., 1903, 36; from Berichte, 1902, 2376.

*Phellomyces Sclerotiophorus—A New Enemy to the Potato.*—Prof. T. Johnson directs attention to *Phellomyces sclerotiophorus*, Frank, a fungus of unknown affinities, which causes a form of scab in potato tubers, and in extreme cases a dry rot. The author first observed it in Ireland in the autumn of 1899. It causes the formation of discolored patches in the skin of the tuber, in the midst of which the minute sclerotia, 0.1 Mm. in diameter, are just recognizable to the naked eye, in washed tubers. It can pass from the tuber to the plant, and is communicable from infected ground to healthy tubers grown in it. The author found that soaking diseased tubers in 0.8 per cent. solution of formalin for one and a half hours destroyed the fungus control, untreated tubers giving a diseased

crop. The fungus was first detected in Germany in 1894 by Frank.—Gard. Chron., 32, p. 400.

*Ergot—Remarkable Claims for its Therapeutic Efficiency.*—In a paper read by Dr. Alfred T. Livingston before the New York County Medical Society (March 10, 1903), an account is given of some new and unusual therapeutic applications of ergot, in which remarkable claims were made for the efficacy of this drug in a wide range of conditions. The most important therapeutic property of ergot was said to be its power to restore equilibrium and tone to the circulation. It was the most effective agent in insomnia, and the sleep produced by it was more natural than that produced by any other drug. In the author's hands it cured a desperate case of morphine poisoning. It was found exceedingly useful in acute alcoholism, in asthma, hysteria, hysteroepilepsy and catalepsy. The President of the Association, Dr. Alexander Lambert, had used it with advantage to relieve the intense tremor and dilapidation resulting from alcoholics, while the most remarkable testimony to the wonderfully curative effects of ergot in a host of diseases was made by the assembled members of the association.—Amer. Drug., May 11, 1903, 252.

*Mylitta Lapidescens—An East Indian Underground Fungus Allied to Truffles.*—In response to inquiries regarding the nature of the so-called "Little Man's Bread" of the Nilgiris, David Hooper explains that it is an underground fungus, *Mylitta lapidescens*, supposed to be allied to truffles, which is used in southern India both as food and medicine. From specimens recently received from Mr. Proudlock, of the Botanical Gardens, Ootacamund, the author is enabled to give the following description of these peculiar structures: The fungoid bodies are like small tubers, having a black, finely-wrinkled surface, and the inside is white and marked with veins, and a section under the microscope shows the division of the tissue into areolate, similar to that exhibited by hypogæous fungi. In a fresh state they have a waxy consistence, but when dry they are hard and horny. Some fresh slices immersed in glycerin for several weeks showed no crystalline formations, and starch was entirely absent. The largest-sized tubers, which are rounded or ovoid in shape, weigh about ten grammes, while the smaller ones weigh only one gramme. According to an investigation made by Dr. E. Winterstein in 1895 this fungus is largely composed of a slimy substance, its percentage composition being as follows: Water, 4.56; ethereal extract, 0.10; protein substances, 2.36; anologues of chitin, 0.91; fungus cellulose, 2.80; saccharo-colloid, 88.98; ash, 0.20.—Pharm. Journ., May 23, 1903, 701.

## LICHENES.

*Iceland Moss—Anti-Emetic Properties.*—Guesdon confirms the anti-emetic action of *Cetraria islandica*, which was first noted by Brismoret in 1890. It is suggested that the tincture of Iceland moss might prove ser-

viceable in the treatment of the vomiting of pregnancy. It is given in doses of thirty drops fifteen minutes before the chief meals. The sedative action of the drug is attributed to its cetraric and proto-cetraric acids.—Pharm. Journ., Dec. 27, 1902, 704; from Bull. gén. de Thérapeut., *114*, 425.

*Cetraria Islandica*, Achar.—Existence of *Cetraric acid* in the free state, which see under "Organic Acids."

FILICES.

*Male Fern—Active Constituent.*—Hitherto the activity of the preparation of the rhizome of *Aspidium filix-mas* has been attributed to filicic acid, which Poulson and Böhm believe to exist in both crystalline and amorphous modifications. The investigations of Böhm, furthermore, resulted in the discovery of three new substances, named by him *flavaspidic acid*, *albaspidin* and *aspidinol*. Dr. F. Kraft, who has undertaken the investigation of the active constituents of male fern with the object of ascertaining the reason and source of the occasional toxic effect produced by the drug, now confirms the presence of the three substances discovered by Böhm, but adds two other substances, *flavaspidin* and an amorphous acid, to which he has given the name of

*Filmaron*, and which pharmacological examination has proven conclusively to be the true anthelmintic constituent of male fern. Filmaron is a bright yellowish-brown powder, insoluble in water, difficultly soluble in cold methyl or ethyl alcohol and petroleum spirit, but very soluble in the other general solvents. Its solubility in petroleum spirit distinguishes it from aspidinol and the filix-nigrins. The rhizome contains about 5 per cent. of filmaron. When dissolved in acetone it slowly decomposes into filicic acid and filix-nigrins; boiling alkalies in conjunction with nascent hydrogen split it up into filicic acid and aspidinol or their decomposition products; with diazoamidobenzol it yields the azo-compounds characteristic of filicic acid and flavaspidic acid. Its empirical formula is $C_{47}H_{54}O_{16}$. It thus becomes apparent that the different constituents heretofore observed are decomposition products of filmaron, and do not pre-exist in the drug. With regard to the pharmacology of these different constituents, Jaquet found that *aspidinol* was destitute of any particular action; that neither *filicic acid*, either crystalline or amorphous, nor *flavaspidic acid*, or combinations of them, have any appreciable anthelmintic action in doses up to 0.5 to 0.8 Gm.; that *albaspidin* in doses of 0.5 Gm. has only slight action, but that *filmaron* is an effective anthelmintic in doses of 0.5 to 0.7 Gm. Dr. Kraft is of the opinion that the varying effects of extract of male fern are due to the variable modes of its administration. The substances that have been isolated are powerful poisons when injected into the blood, and it is therefore desirable to induce them to exert their taeniafuge action

and at the same time prevent them from passing into the circulation of the patient.—Pharm. Ztg., 1903, 275.

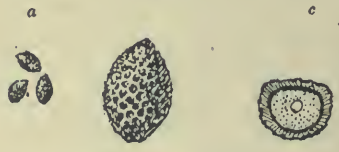
*Aspidium Filix-mas—Substitutions.*—V. Penndorf has investigated the subject of substitutes offered and sold as male fern. He observes that the only ferns likely to be gathered for the purpose of substitution are *Aspidium spinulosum* and *Athyrium filix-femina*. The rhizome of the latter is easily distinguished, but that of *A. spinulosum* is not so easily recognized, since the steles resemble in shape and number those present in the genuine drug, *A. filix-mas*, though, according to Laurén, the two rhizomes are distinguishable from each other by the numerous small glands found on the margin of the scales of *A. spinulosum*, while only two are to be found on the scales of *A. filix-mas*. The author has examined twenty samples of male fern, procured from different localities in Germany, and found in twelve of them the rhizomes of *A. spinulosum*, the quantity of this adulterant varying from 5 to 90 per cent. of the drug. Under these conditions it was naturally expected that the

*Extracts of Male Fern* would also give evidence of this substitution, but while these showed decided differences in appearance, one out of twenty samples examined contained *aspidin*, a yellow, crystalline substance, m. p. 124°–125° C., which is found only in *A. spinulosum*. The percentage of *filicic acid*, to which the activity of male fern is due, varied between 1.0 and 7.3 per cent., but much of this was found in the crystalline precipitates which characterized thirteen out of the twenty samples, the amount of filicic acid in actual solution varying between 0.4 and 3.0 per cent. Seven of the samples of extract examined were practically free from precipitate.—Apoth. Ztg., 1903, 141.

AROIDEACEÆ.

*Arum Fruits and Seeds—Concise Description*—Dr. E. M. Holmes describes the fruits of *Arum maculatum*, L., as red berries borne on a fleshy stem a few inches above the ground, and, like the root of the plant, very acrid. The seeds are oval, about 8 Mm. long by 4 Mm. in diameter, brownish and tuberculate on the outer surface, resembling in this respect those of the elderberry (which see under "Caprifoliaceæ"), which, however, are smaller and have a harder shell (endocarp), and show, when cut across, a flat dicotyledonous embryo in albumin, that of *Arum maculatum* being monocotyledonous and cylindrical. Fig. 38, at *a*, shows the arum seed in natural size; at *b*, magnified 4 diameters; and at *c*, in transverse section.—Pharm. Journ., Jan. 3, 1903, 6.

FIG. 38.




Arum Fruits and Seeds.

*Calla Aromatica—Chemical Constituents.*—D. Hooper has subjected

the aromatic root of *Calla aromatica* to chemical examination. This root is known in Bengal as "Gondo matre," and is esteemed by the natives on account of its aromatic fragrance—which is between ginger and nutmeg. It is used as an insect powder and also as a perfume. The author finds that it contains about 1 per cent. of a fragrant greenish volatile oil, a resin, an amorphous saccharine body, and a trace of an alkaloid.—Pharm. Post, *35*, 24.

*Carludovica—Species Yielding the Material for Panama Hats.*—Attention is directed in the "Bulletin of Botanical Department, Jamaica" (*9*, 145) to several species of *carludovica*, which yield the material from which the so-called Panama hats are made, namely,

*Carludovica Palmata*, which grows in the damp forests of Ecuador, Peru and in New Grenada, and

*Carludovica Jamaicensis*, known as the "Ippi-appa plant," so named after the island in which it is indigenous, where it grows in sheltered valleys near water. The method of preparing the straw is to take a young unopened leaf and divide it down the centre, leaving a portion of stalk attached to each half. From the two sides of each half the ribs or nerves are torn away. After being boiled in water to enable the segments of the leaf to be stripped off down to the stalk the straw is exposed to the action of the sun and dew for three days and nights; the alternate bleaching and drying constitute the curing process. A leaf of the Ippi-appa plant produces one "head" of straw, and a hat requires from ten to twelve heads. —Pharm. Journ., Jan. 10, 1903, 29.

GRAMINEACEÆ.

*Maize—Sitosterol, not Cholesterol, a Constituent of the Oil.*—According to the investigations of A. H. Gill and C. G. Tufts, the cholesterin body present in maize is not cholesterol, as stated by Hoppe-Seyler and Hopkins, but a body having a lower melting point, which they have identified with the sitosterol found by Burian in wheat and rye.—Journ. Amer. Chem. Soc., 1903, 251.

*Maize—Presence of a New Albuminoid, Maizin*, which see under "Organic Chemistry."

*Popcorn—Improved Mode of Popping.*—Referring to an explanation recently given that the popping of popcorn is due to the presence of water in the seeds, which on heating is converted into steam within, and causes it to burst when sufficiently heated, M. I. Wilbert observes that this offers a feasible explanation of the phenomenon, with the single exception, that, instead of supposing each kernel to be a mass of corn, or corn-starch and water, enveloped in a hard shell, we must suppose that each individual cell is a miniature sealed container, the walls of which are sufficiently dense to retain the contained moisture, until the same has been converted

into steam under pressure. He furthermore calls attention to the fact that when the corn is old and dry, the resulting popcorn is decidedly tough and not very light, but on soaking the kernels in water for twelve hours, and allowing them to dry for thirty-six hours, the resulting kernels of popped corn were not only very long, light and flaky, but had absolutely no suggestion of toughness when first popped.—Amer. Journ. Pharm., Feb. 1904, 77–79.

*Sugar Cane—Formation of Gum in the Diseased Stalk Due to Bacterium vasculosum*, Cobb.—See *Gum*, under "Organic Chemistry."

*Sugar Cane—Improvement by Propagation and Selection.*—J. D. Kobus has made a series of experiments, undertaken, (1) to ascertain whether it is possible to improve sugar canes by vegetative propagation of selected plants; and (2), to find out whether there is any correlation between the amount of sugar present and the power of resisting the *sereh* disease. The results obtained from experiments extending over a period of several years and involving very numerous analyses, promise to be very valuable to sugar planters. It is shown that for any given variety of the sugar cane, when grown under uniform conditions, the heavier the plant the greater is the proportion of sugar formed. Also that by taking cuttings from canes which contain a large amount of sugar, the plants so obtained continue to show this increase. Further, it was found as the proportion of sugar was increased by selection, according to the total weight of the plants, so does the power of resistance to the *sereh* disease also become greater.—Pharm. Journ., Nov. 22, 1902, 523; from Annales du jar. bot. de Buitenzorg, *8*, 67.

*Chinese Rice—Analysis of Samples Supplied in Hong Kong.*—Frank Browne, Government Analyst, reports the results of a series of examinations made of some of the cheapest kinds of rice to be obtained in Hong Kong. The aim of the inquiry was to ascertain the nutritive value of the rice consumed in the poorest and most plague-infected districts of the colony. As far as the nutritive value of the rice is concerned the results are favorable. The amount of albuminoids in Chinese rice, particularly in the clean grain free from integument, is high compared with what it had been supposed to be. This is of much interest, as in calculating out the diets for Chinese engaged on hard labor it had been found that if the percentage of albuminoids in rice be taken at 5 (the figure hitherto adopted) a much larger ration of more albuminoid substances, such as fish, was theoretically required by these persons than practically was found to be needed. The results are expressed in the following table as parts in 100 parts of the sample:

| No. | Appearance of Grain. | Color of powder. | Moisture. | Ash. | Fat. | Albuminoids or N. × 6.33. | Starch. | Vegetable Fibre. |
|---|---|---|---|---|---|---|---|---|
| 1 | Sprinkling of powder.. | white | 13.78 | 0.72 | 0.30 | 8.64 | 71.83 | 4.73 |
| 2 | Sprinkling of powder.. Some integument present..... | pale yellow | 13.13 | 1.09 | 0.56 | 5.56 | 71.19 | 8.47 |
| 3 | As 2..... | do | 13.38 | 1.10 | 0.21 | 6.58 | 73.38 | 5.35 |
| 4 | Much integument..... | grey | 12.95 | 1.77 | 0.38 | 6.64 | 72.71 | 5.55 |
| 5 | Sprinkling of powder. | white | 13.15 | 0.64 | 0.35 | 7.82 | 75.71 | 2.33 |
| 6 | do | do | 14.13 | 0.73 | 0.50 | 7.08 | 75.95 | 1.61 |
| 7 | do | do | 13.47 | 0.59 | 0.30 | 7.08 | 76.93 | 1.63 |
| 8 | do | do | 13.42 | 0.40 | 0.15 | 7.51 | 77.18 | 1.34 |
| 9 | Clean translucent grain. | do | 13.25 | 0.38 | 0.34 | 7.21 | 76.68 | 2.14 |
| 10 | do | do | 11.95 | 0.47 | 0.43 | 7.40 | 79.50 | 0.25 |

Sample No. 9, bought as being good rice, may serve as a standard, as may sample No. 10, supplied subsequently.—Pharm. Journ., Sept. 13, 1902, 276.

*Flour—Detection of Corn-Cockle.*—Most of the works on the microscopy of foods recommend the detection of corn-cockle seeds (*Agrostemon githago*), by means of the rose color assumed by a mixture of alcohol and hydrochloric acid when shaken with the flour or by the recognition of the very characteristic epidermal cells of the seed. H. Kober finds that the process of milling almost entirely removes the epidermis, so that it is impossible to find it in the flour, hence this method of detection is, in his opinion, not available. The color reaction succeeded with a flour containing 5 per cent. of corn-cockle flour, but not with less. He therefore recommends the extraction and recognition of the sapotoxin contained in the corn-cockle seeds as follows: 20 Gm. of the suspected flour are extracted hot with a mixture of 80 Gm. of chloroform and 20 Gm. alcohol, and filtered whilst as hot as possible. The filtrate is evaporated to dryness. The residue is treated with a little hot water, filtered, and again evaporated to dryness. This is mixed with a few drops of concentrated sulphuric acid. If the flour is pure it remains almost colorless, but flour containing as little as 1 per cent. of corn-cockle gives a residue which generally assumes a yellow color, changing to brown. It must, however, be pointed out that Vogl says the determination of corn-cockle in finely-sifted flours can be effected by the detection of the remarkable starch grains of the corn-cockle seed, which are very conspicuous; in coarse flours the seed-coats are available for the same purpose.—Pharm. Journ., Dec. 20, 1902, 663; from Zeitschr. f. Nahrungs u. Genussm., *5*, 1077.

*Andropogon Citratus* (?)—*A Source of Citronella Oil in the Camaroons.*—It is stated in "Tropenpflanzer" (Vol. 7 [1903], 37), that in the Botanical Gardens at Victoria in the Camaroons, under the name of *Andropogon citratus*, a species of grass is cultivated, which, according to an examination by Strunk, yields an oil which is seemingly identic with citronella oil. He distilled 10 kilos of the fresh grass with water, and obtained a yield of 0.38 per cent. oil. With the primitive means at his disposal he was able to ascertain that this oil contains about 15 per cent. of an aldehyde, which appears to be identic with citronellal. According to the foregoing the grass cultivated at Victoria, of which it had not hitherto been possible to determine the species as the plant never reached the flowering stage, may possibly be identic with *Andropogon nardus* L., which in the East Indies is cultivated on a large scale for the production of citronella oil.—Schimmel's Rep., April–May, 1903, 23.

PALMACEÆ.

*Palm and Palm-nut Oils—Distinction and Yield.*—G. Fendler-Steglitz contributes an interesting account of palm oil and palm-nut oil, with especial reference to the quantity and composition of the oils yielded by varieties of palm fruits obtainable in German East and West Africa. The bunches of fruits vary as a rule from 20 to 30 kilogrammes in weight, but they may attain as much as 50 kilogrammes; the separate fruits weigh from 3.5 to 10.0 or more Gm. The latter resemble plums in shape, and are of of an orange or fiery-red color; within the fibrous pericarp there is a single seed enclosed in a hard shell. The pericarp constitutes from 24 to 70 per cent. of the fruit and contains from 46 to 66 per cent. of palm oil; the seed, amounting to between 9 and 25 per cent., yields the palm-nut oil. The palm oil from the pericarp is obtained by the following crude method: A large cauldron is filled with the fruits, and sufficient water to cover them added; they are then boiled for one and a half to two hours, by which the pericarp is loosened so that it can be easily separated from the seeds and pressed. The water is now poured off, and the fruits are pounded in wooden troughs with stampers. As much oil as possible is now pressed out with the hands; the residue is mixed with water and again pressed, the seeds being then separated from the pulp. The first pressings are set aside, but the second are switched until a yellow froth containing the oil rises; this is skimmed off, heated, and the oil added to the first pressings. The residue of pulp, which naturally contains a large quantity of oil, is thrown away, and much oil is thereby lost. It is calculated that only one-third of the oil in the pericarp is obtained by this crude method. The seeds are cracked, the kernels separated and exported to Europe, where palm-nut oil is pressed from them. They yield from 43 to 50 per cent. In varieties of fruits from Togo, the author found from 14.4 to 16.2 per cent. of palm oil and 7.2 to 12 per cent. of palm-nut oil, whereas Strunk

found in the Liscombe variety from Cameroon 44.4 and 6.15 per cent. respectively. If the fruits are heaped and allowed to stand, the oil is rapidly split into glycerin and free fat-acids by the lipolytic enzymes present. The author raises the question whether it would not be advantageous to induce that decomposition, and thus save the trouble and expense necessary to bring it about in the manufacture of candles.—Pharm. Journ., June 27, 1903, 867; from Berichte Pharm., *13*, 115.

*Coco-nut Meal—Value as Cattle Food.*—Attention is directed in "Agricult. News" (*1*, 259) to the value of the press-cake remaining after the expression of coco-nut oil as a food for cattle and horses. Compared with linseed and cotton-seed cake, it contains an equal quantity of fat, about 4.6 per cent. more of starchy and saccharine matter, but about 10 per cent. less of proteids.

SMILACEÆ.

*Sarsaparilla — True and False Varieties.* — In continuation of his previous observations and studies of commercial varieties and substitutes of sarsaparilla, communicated in 1894 and 1898, C. Hartwich gives a macroscopic and microscopic description of a number of true and false sarsaparillas that have been acquired for the pharmacognostic collection of the Zurich Polytechnicum during the past decade. He divides them into three groups: (1) Genuine sarsaparillas, bearing all the macroscopic and microscopic characters of the genuine drug, but differing from the sorts heretofore described; (2) false sarsaparillas, which are easily distinguished from the genuine sorts, but have reached the European markets as sarsaparillas, and (3) such as have not yet reached the European markets, but are employed as sarsaparillas in their native countries.

The author's description is illustrated by cuts displayed in two tables, and embraces the following false sarsaparillas: (1) *Rajania cordata*, Vell. Sarsaparilha do Mato (Brazil); (2) *Herreria sarsaparilla*, Mart. Sarsaparilha do Mato; Sarsaparilha brava (Brazil); (3) A false Sarsaparilla from Brazil; (4) *Mühlenbechia sagittifolia*, Meissn. Zarzaparilla from Argentina; (5) *Smilax spec.* False Sarsaparilla from Columbia; (6) Smilax spec. from Argentina; (7) Pteris spec. (the root of a fern, described by Greenish in 1893); and (8) Sarsaparilla from Nicaragua (resembling externally Vera Cruz Sarsaparilla).—Arch. d. Pharm., *240*, No. 5 (July 25, 1902), 325–335.

*Sarsaparilla—Question of Retention in the U. S. P.*—Prof. P. E. Hommell, after a comprehensive review of the literature on the history, chemistry and therapeutic value of sarsaparilla, arrives at the conclusion that it should be disposed of now by the Revision Committee of the U. S. P., as it is therapeutically an inert agent, so far as an alterative is concerned. The analyses given from 1818 down to the present day, show sarsaparilla to consist chiefly of bitter acrid extractives, starch, mineral and coloring

matters, and an acrid glucoside called parillina, identical with saponin, which at different times received the designations of smilacin, pariglin, parallinic acid, salseparine. The other substances found as volatile oil, albumen, coloring matter and mineral ingredients amount to nothing as they exist according to analysis only in minute quantities. The pharmacist is seldom called upon to dispense sarsaparilla, except in the form of the compound syrup. The other officinal preparations have seen their best days. The comp. syrup is only prescribed occasionally with the iodides of potassium and sodium, and sometimes mercurials, to disguise the unpleasant taste of those remèdials, but seldom for any alterative and antisyphilitic action, as the average physician knows that sarsaparilla contains none.—Proc. N. Jersey Pharm. Assoc., 1902, 65–72.

LILACEÆ.

*Aloes—Review and Investigation of Commercial Varieties.*—Martin I. Wilbert, with a view of collecting some reliable data as to the differences in quality or source of the aloes sold under varying trade names at the present time, has made a systematic study of a number of available samples and communicates his results in a thesis presented to the Faculty of the Philadelphia College of Pharmacy for the degree of Master in Pharmacy. The variation of aloes received from wholesale druggists, drug brokers, importers and manufacturers in different parts of this country, as well as from Germany, from Curaçao and from Barbadoes, were the following: Socotrine, Cape, Barbadoes, Curaçao, Uganda (or Crown), Jaffarabad and Natal aloes. His studies and investigations of these varieties cover their history, botanical origin and sources, chemistry, tests of identity and distinction, adulteration and sophistication and their trade relations in the United States. From all of these it would appear that the different varieties of aloes on the market at the present time may be divided into two classes or groups: one containing barbaloin with little or no isobarbaloin, and the other containing considerable quantities of isobarbaloin in addition to the barbaloin. Sufficient aloes of good quality is available at the present time to warrant the introduction of restrictions as to purity and water content, that would do away with retaining in our Pharmacopœia the title and formula for "Aloe Purificata," and with continued research into the chemistry of aloes it is also quite probable that the immediate future will give us a modified aloin, or an analogous compound that will more nearly represent the active cathartic principle of aloes than does the aloin available at the present time. Moreover, the general use of powdered aloes would facilitate the testing for impurities and guarantee a product fairly even as to water content. As an outline of pharmacopœial requirement, the author suggests the following:

*Aloe-Aloes.*—The inspissated juice of different species of aloe grown in tropical or sub-tropical climates. Aloes varies from reddish-brown to

deep black in color and may have a glossy or opaque surface, according to the mode of preparation. Powdered aloes may vary from light-yellow to brown or greenish-brown in color. Aloes should not contain more than 10 per cent. of water, and leave on incineration more than 3.5 per cent. of ash. It should be almost entirely soluble in 50 per cent. alcohol, U. S. P. acetic acid or a 1 per cent. solution of ammonium hydrate. Aloes should react to Borntraeger's test for emodin. On mixing a small quantity of aloes with strong sulphuric acid and blowing the fumes of nitric acid over the surface of the mixture, it should not assume a blue color—absence of Natal aloes.

Aloes may be divided into two general groups or classes:

*Aloes A*—containing barbaloin; responds to Borntraeger's test for emodin, but does not give a distinct red color with nitric acid, or with Klunge's test.

*Aloes B*—contains isobarbaloin with barbaloin; responds to Borntraeger's test for emodin, and also gives a deep red color with strong nitric acid or with Klunge's test.—Amer. Journ. Pharm., May and June, 1903, 201–214 and 264–273.

*Cape Aloes—Source and Preparation in the Mossel Bay District, South Africa.*—Inquiries made by Prof. Tschirch have resulted in an interesting communication by Dr. Marloth concerning the source of Cape aloes and the method of preparation in the Mossel Bay district, South Africa. Only plants of

*Aloe ferox*, Miller, *having spiked leaves*, are used in this district, because it is found that other species of *Aloe* growing in the same district yield a thin juice which is unprofitable to work. While it is undoubted that true *A. ferox*, Miller, may not have spiked leaves and yet yield good aloes, preference is given to the spiked variety because the leaves, having large thorns, stack well and are consequently more conveniently extracted. The extraction of the juice is carried on according to the old primitive method. A hole is dug in the ground and lined with a goat-skin or horse-skin, and the leaves which are cut off are put into it, cut-end downwards, to form a stack about a meter high. After a few hours the leaves are thrown aside, and the juice is poured from the skin into a suitable container—usually an empty can. In the evening the juice is boiled over an open fire in iron pots. In this way the drug obtains its dark, glassy quality. Drying over an open fire is very troublesome work. The juice has to be stirred continuously in order to prevent the aloes charring, and the fumes get into the eyes of the workmen. If the juice is not sufficiently boiled the aloes "runs." For this reason many aloe-juice collectors prefer to sell the juice to factors instead of converting it into merchantable aloes themselves. Recently an enterprising manufacturer has considerably improved upon the old method of making Cape aloes. He gets the juice brought to his

factory in barrels, and after it undergoes a slight fermentation it is dried in the sun in flat wooden troughs. It is this kind which comes into trade as "Crown" aloes. When it first came into the market it was called "Uganda aloes." There certainly appears to be a future for this new preparation; Professor Tschirch says that whilst it has a different appearance from Cape aloes, it is decidedly better, and he suggests that those Pharmacopœias which recognize Cape aloes should include a description of the "Crown" brand. The paper is illustrated by six half-tone cuts, showing the plant—*Aloe ferox*, Miller; the method of cutting of the leaves; the method of stacking and draining into goatskin; the pouring of the juice from the goatskin into a kerosene-tin; the evaporation of the juice over an open fire, and the "Crown"-aloes factory.—Chem. and Drug., April 25, 1903, 664–665.

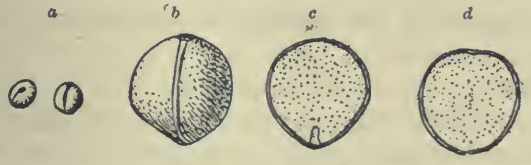
*Aloes—Percentage of Aloin in Different Sorts.*—Using chloroform and methylic alcohol in slightly modified proportions as solvent, E. Léger has determined the aloin content of different sorts of aloes; he employs a mixture of chloroform, 1,800 Cc., and anhydrous methylic alcohol, 600 Cc. The whole is digested under a reflex condenser for four hours, then decanted, the solvent distilled off, the residue redissolved in just sufficient anhydrous methylic alcohol to form a syrupy solution, and then exposed in a cool place for several days, when the aloin crystallizes out. Cape aloes thus treated gave 5 to 6 per cent. of barbaloin without any admixture of isobarbaloin. True Barbados aloes of English commerce never gave more than 5 per cent. of barbaloin, with but minute traces of isobarbaloin, which, however, is always met with in the so-called Barbados aloes of French commerce. It would appear, therefore, that French and English Barbados aloes are not identical. Curaçao aloes is rich in aloin, containing 10 per cent., half of which is barbaloin, the other half isobarbaloin. Jafferabad aloes is very rich in aloin, yielding 20 per cent., chiefly in the form of isobarbaloin, barbaloin being rare in this aloes. Socotrine aloes does not contain more than 4 per cent. aloin, almost wholly barbaloin with a very little isobarbaloin. Since barbaloin is found in Cape, Barbados, Curaçao, Socotrine and Jafferabad aloes, and Tschirch and Klaveness have recorded it as capaloin (P. J. [4], *13*, 33) in Uganda aloes, the significance of the prefix "barb" is misleading. The only aloes in which it does not occur is that of Natal. Isobarbaloin is found in Barbados aloes of French commerce in Curaçao and Jafferabad, and in small quantity in Socotrine aloes.—Pharm. Jour., July 12, 1902, 22; from Journ. Pharm. Chim. [6], *15*, 519.

*Indian Potatoes—Botanical Source.*—A considerable number of bulbous liliaceous plants found in California are used by the Indians, either raw or cooked, as a nutritious food. Some of the more imporant are a species of *Calachortus*, *Dichelostemma*, *Triteleia*, *Hookera* and *Quamasia*. These bulbs are commonly designed as "Indian potatoes."—Contrib. U.S National Herbarium, 7, 322.

DIOSCORIACEÆ.

*Black Bryony Fruit and Seeds—Concise Description.*—Dr. E. M. Holmes describes the fruits of the black bryony, *Tamus communis*, L., as being bright red, glossy, oval, about the size of a horse bean, and attached to twining stems without any tendrils. The seeds are nearly globular, about 8 Mm. long by 6 Mm. broad, yellowish, with a small scar at the base and apex, the basal one being the larger, and from it faint furrows radiate nearly to the apex. When cut across the seed appears to be solid, the minute oval-oblong monocotyledonous embryo not being visible, unless the seed is cut close to the smaller scar. The seed is shown by Fig. 39,

Fig. 39.




Black Bryony Seed.

*a*, in natural size; *b*, magnified 4 diameters; *c*, in longitudinal section, showing embryo at base; and *d*, in transverse section.—Pharm. Journ., Jan. 3, 1903, 5.

AMARYLLIDACEÆ.

*Century Plants—Useful Products.*—William B. Marshall contributes an interesting account of the useful products obtained in Mexico and Central America from certain so called century plants. Perhaps the most important of these is the "sisal fibre," which is obtained from a species of agave, known to botanists as

*Agave rigida sisalana*, and constitutes an important rival of the Manilla hemp of the Philippine Islands. Other species of *Agave*, as is well known, yield an abundance of sap, which is utilized for making certain popular Mexican beverages, such as pulque, mescal, aguardienta de maguey, or mexcal, and teguila; the juice itself, before fermentation, being known as aguamiel. While the fibre and the sap are the most important products of these century plants, and it is for these they are cultivated, there are many other uses to which the plants and their products, by-products and wastes of the fibre-extracting mills are applied. The waste fibre of the mill is used for oakum, as packing, and for making coarser paper. A handful of this waste serves as a toilet sponge. The sharp spines of the leaf are useful as a nail, a strand of fibre attached to it serves as a threaded needle and as such is used for sewing coarse fabrics; the flower stalks are used for fishing poles, lance-handles, for constructing huts; the leaves as fodder and to thatch huts, and the roots of one species—*A. saponaria*—are used as soap substitutes.—Amer. Journ. Pharm., July, 1902, 323–335.

AMOMEACEÆ.

*Turmeric—Detection in Complex Powders by Diphenylamine.*—In the course of the examination of a complex powder, Albert E. Bell observed that on adding a drop of diphenylamine reagent a fine purple coloration of great intensity is developed. On investigation, this color-reaction proved to be due to turmeric contained in the powder, and that by means of this reagent it was quite possible to detect one part of turmeric in 200 parts of rhubarb or 1000 parts of mustard. The test, which is much more delicate, convenient and rapid than the boric acid test, is applied by spreading the suspected powder on a drop of the reagent previously placed on a microscopic slide. The reagent is prepared by dissolving 1 Gm. of diphenylamine in 20 Cc. of 90 per cent. alcohol, then slowly adding 25 Cc. of pure sulphuric acid and allowing to cool.—Pharm. Journ., Nov. 29, 1902, 551.

ARISTOLOCHIACEÆ.

*Asarum Arifolium—Yield and Characters of Volatile Oil.*—Emerson R. Miller finds that the dried herb of *Asarum arifolium* yields from 7 to 7.5 per cent. volatile oil on steam distillation. The sp. gr. of this ranged from 1.0585 to 1.0613; the opt. rot. between —2° 55″ and —3° 7′; the refractive index from $n_D^{20}$ 1,531460 to $n_D^{20}$ 1,531875. It has a pleasant odor recalling that of sassafras, and a burning taste. Shaken with caustic alkali about 0.5 per cent. of phenols is removed. The oil is found to contain: lævopinene, eugenol, an unidentified phenol, methyl-eugenol, methyl-iso-eugenol, safrol—the chief constituent—asarone and a high boiling fraction, probably a sesquiterpene.—Archiv. d. Pharm., *240*, 1902, 371.

SANTALACEÆ.

*Santalum Album—Danger of Extinction by Disease in Southern India.*—Frederic A. Mason, for many years connected with a manufacturing firm using large quantities of sandal oil, calls attention to the threatened extinction of *Santalum album* in Southern India. This plant, as is known, is a parasite, living upon, or rather drawing its water and mineral salts from its host. It seems to be incapable of deriving the minerals direct from the soil, and, from the investigations of Mr. Barber and Dr. Butler, who have been delegated by the Indian Government to investigate the matter, it would appear that this disease is entirely connected with the root ends. The author explains the course of the disease, which is evidently incited by infection. Like other members of the order *Santalaceæ*, it attaches its roots to those of other plants and sucks their juices for its own growth, the roots being inextricably united with those of the other plants. The suckers of the sandal being from 100 to 150 feet long in many cases, it is easy to see how disease, once incited in a plant, may soon infect all the plants in a plantation. The responsibility for the spread of the disease is apparently to be placed on the methods of cultivation prac-

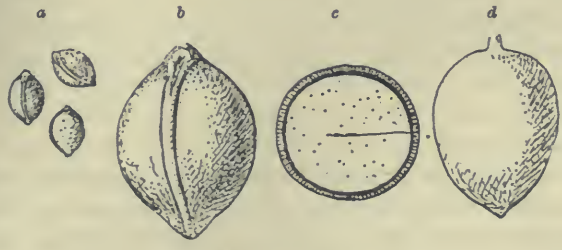
ticed during the last thirty or forty years. Lantana and casuarina plantations have been made in Mysore and Goorg, in conjunction with young sandals, under the belief that their shade helped the growth of the latter. Mr. Barber suggests that the supply of poisoned food they afford to the sandals may be the cause of the trouble, and that means should be taken to stem the torrent of the invasion. The old plan was to let self-sown plants propagate themselves, and this would ensure greater isolation and less danger of infection from neighboring plants.—Pharm. Journ., May 30, 1903, 756.

*Santalum Album—Questionable Parasitic Nature.*—G. M. Woodrow questions the accuracy of the statement which has been made to the effect that *Santalum album* is a root parasite, at all events in its earliest stages. He has failed to find evidence of parasitism in a plant which had sprung up in a large pot with a plant of another sort. He found that the santalum potted by itself grew well. He asks for assistance in determining the point from those in India, who have the opportunity for careful observation and experiment.—Pharm. Journ., Nov. 22, 1902, 523; from Gardener's Chronicle, October 25, 1902, 309.

THYMELÆ.

*Mezereon Fruits and Seeds—Concise Description.*—Dr. E. M. Holmes describes the fruits of *Daphne Mezereum*, L., as globular berries, about the size of a large pea, bright red (or in the white flowering species, bright yellow), and containing a single egg-shaped seed of a dark brown color, covered with a thin greyish skin, and marked on one side with a yellowish line (raphe). The transverse section shows two cotyledons without albumen. The seeds are about 14 Mm. long and 9 Mm. broad,

FIG. 40.




Mezereon Seed.

have an acrid and burning taste, and are shown in natural size at *a*, Fig. 40; at *b*, magnified 4 diam.; and at *c*, in transverse section.—Pharm. Journ., Jan. 3, 1903, 6.

LAURACEÆ.

*Cinnamon—Adulteration of the Powder with Extracted Galangal.*—A

histological examination of samples of powdered cinnamon, by W. Schnitz, showed the presence of yellowish-brown splintered fragments, unattacked by acids and alkalies, but turning black with ferric chloride, and free from oil cells. He attributes this to the presence of powdered galangal rhizome, which had probably been previously extracted.—Zeitschr. f. Œffentl. Chem., 1903, 32.

*Camphor—Practical Experience in its Production in Florida.*—The experience of Thomas B. Baker in the cultivation of the camphor tree in Florida and the production of camphor from it points out that the camphor industry is likely to prove a profitable substitute for orange culture in that state. There need be no hesitancy in planting the camphor trees on account of possible danger from severely cold weather, for fine specimens of the tree that had not been injured in the least by the great freezes were growing in many yards and groves in Florida. Indeed the tree grows well in southern Georgia and is rarely injured by cold that far north. In the camphor-producing regions of the East the camphor is obtained chiefly from the trunk and larger limbs of the tree, the wood being reduced to fineness by means of an axe or scraper. Trees of a less age than fifty years are not regarded as sufficiently rich in the gum to yield enough to pay for working them. In Florida it is proposed to distill only the leaves and small branches. From various analyses that have been made of this material, it has been found that seventy-seven pounds of leaves and a greater weight of twigs are required to yield one pound of camphor. It is expected that leaves and cuttings can be taken from the tree at least twice a year. The author has tried several forms of distilling apparatus, and has used several different kinds of material in their construction, but his best results have been obtained with an apparatus somewhat similar to that used in the camphor groves of the East. It is made almost entirely of wood, as follows: The retort part of the apparatus is a box which is water-tight and as nearly as possible, steam-tight. It is made as follows: Four good boards about one and one-half feet long and fourteen inches wide, are nailed together so as to form a box without ends. Strips an inch or more wide are put around each end to increase the end surface. Then a piece of tinned sheet copper (ordinary tin-plate or sheet-iron would answer very well) is nailed on one end for a bottom, and, for the other end, to be the top of the apparatus, a wooden cover is made that can be fastened on by bolts passing downward through the strips, and provided with thumb-screws. Cleats are fastened around the inside of the box about three inches from the bottom to support an easily removable perforated board. The compartment below this board is for the water, and that above it for the camphor material. A delivery tube made of a piece of bamboo stalk with the joint-plugs bored or burned out (or a wooden tube of any kind) with one end closely fitting a hole made near the top of the box, and inclining, when in place, at an angle of about thirty degrees, completes the retort

part of the apparatus. The condenser is simply a bucket or tub into which cold water is kept flowing constantly, and the flow is so regulated that the water-level is kept two or three inches from the top of the vessel. The outflow opening is below the surface of the water. The lower end of the retort tube is so adjusted that it will be close to the water. The camphor condenses on the water and in the end of the tube.—Drug. Circ., Sept., 1902, 180.

MYRISTICACEÆ.

*Myristica Kino—Presence of an Active Enzyme.*—David Hooper, having recently received a fresh supply of the fluid kino, a natural juice derived from the "Syndai" tree *Myristica gibbosa* Hook. f., which is used in Assam for varnishing doors and windows of native houses, and is known as

"*Syndai*" *Varnish*, has subjected it to chemical examination. The rich, red juice, which is highly astringent, after exposure to air some time, becomes perfectly impervious to water. The rapidity with which this change occurs seemingly indicating the presence in the liquid of an enzyme or oxydase similar to that found by G. Bertrand (1894) in the lacquer tree of China and Japan, the author's investigation was mainly carried out in this direction. As expected, the juice was found to contain an enzyme, which proved to be very active, retaining the activity even when its solution was exposed to a temperature of 90° C., but losing it when boiled in water at 100° C. It is thus shown that the juice of the wild nutmeg tree, or "Syndai" varnish, contains a very active ferment, which appears to be the cause of the profound changes which its properties undergo when exposed to the air. It dries up much sooner than the juice of the

*Malabar Kino* * tree, *Pterocarpus marsupium*. A sample of the juice of the latter, preserved in the Indian Museum since April, 1899, in a vessel not hermetically sealed, being still liquid, whereas "Syndai" varnish, even if kept in corked bottles, gelatinizes in the course of a few weeks.—Pharm. Journ., June 20, 1903, 840.

SAPINDACEÆ.

*Dialiopsis Africana—A Saponin the Poisonous Constituent of the Seeds.*—Radlkofer has examined the plants yielding the seeds of *Dialiopsis africana*, brought from East Africa by Busse, and proposes a new genus as well as species for it. Beitter extracted from the seeds a poisonous glucoside belonging to the class of saponins.—Pharm. Journ., Dec. 13, 1902, 627; from Ber. d. d. Pharm. Ges., 1902, 213.

POLYGONEÆ.

*Chinese Rhubarb—Chemical Examination.*—A. Tschirch and K. Heu-

* See also under "Leguminosæ."

berger, after briefly reviewing the history of the researches upon the chemical constituents of rhubarb, which dates back to the last quarter of the eighteenth century, give the details of a comprehensive study undertaken for the purpose of explaining and reconciling the contradictory statements concerning the active constituents of rhubarb that are found in the literature. They have obtained by methods explained, and have described the following constituents: Chrysophanic acid; rheum-emodin; rhein; Aweng's primary glucoside (rheo-tannoglucoside); Aweng's secondary glucosides (secondary glucoside and anthraglucosides); and rheonigrin; and summarize their results as follows:

It is evident that rhubarb contains as the result of primary formation in the plant two classes of substances, namely, *tanno glucosides* (rheo-tannoglucosides) and *anthra glucosides* (rheo-anthraglucosides). These two classes of substances cannot be sharply separated from each other and therefore are associated together in all extractions. Both of these are characterized by their ready decomposition and conversion into secondary products, such conversion resulting even during the treatment of the drug with ordinary solvents. Thus, the ether extraction has been found to contain the products of the hydrolysis of the anthraglucosides, namely, chrysophanic acid, emodin and rhein. It is however not proven,—indeed not even probable—that the tannoglucosides combine with the anthraglucosides to form so-called double glucosides. On the contrary, the indications are that these two classes of glucosides occur beside each other. Furthermore, the relatively large quantity of tannoglucosides and their hydrolytic products is noteworthy and that, therefore, the activity of rhubarb is not attributable solely to the anthraglucosides; but the activity of the latter must be materially modified by that of the tannoglucosides. To what degree the primary tanno- and anthraglucosides have become hydrolyzed in the drug itself, it is difficult to determine; it is certain, however, that the drug contains a considerable quantity of free oxymethyl-anthraquinones, while it is probable that the formation of the secondary glucosides results during the extraction and manipulation of the extract. It is also noteworthy that a very mouldy specimen of rhubarb yielded much more free oxymethyl-anthraquinones than a specimen of the same that had not become mouldy. But, whatever uncertainty may remain in other directions, the authors are now confident that the relations of the various rhubarb constituents heretofore described in the literature to the bodies described in their present paper, are correctly given as follows:

*Aweng's Double Glucoside* is in its essentials identical with the authors' tannoglucoside, but contains some anthraglucoside.

*Aweng's Frangulic Acid* is a secondary product of the decomposition of the tannoglucoside, containing variable quantities of anthraglucoside as impurity.

*Kubly's Rheumtannic Acid* and

*Hunkel's Tannoid*, are identical with the author's tannoglucoside, but less pure.

*Kubly's and Hunkel's Rheum Acid* is identical with the author's rheum red, and therefore a product of the hydrolysis of tannoglucoside.

*Schlossberger and Dopping's Aporetin and Phaeoretin* are impure, difficultly soluble tannoglucoside.

*Erythroretin* is a mixture of chrysophanic acid, emodin and rhein.

*Garot's Erythrose* is chrysamic acid.

*Rhein*, yielding only a diacetyl derivative, cannot be regarded as being tetraoxymethyl-anthraquinone. It has the composition $C_{15}H_8O_6$ (not $C_{15}H_{10}O_6$ Hesse), which formula corresponds to a methylene ether of a tetraoxyanthraquinone.

*Dragendorff's, Greenish's and Elborne's Cathartic Acid* is an impure tannoglucoside, containing anthraglucosides and some albuminoid substances.

*Gilson's Chryrophan* belongs to the anthraglucosides.

*Aweng's Secondary Glucosides* are secondary, mostly difficultly soluble hydrolytic products of the primary tanno- and probably also of the anthraglucosides.

Finally, the authors have determined that rhubarb contains no resins whatever; that the rheo-tannoglucosides and their products of decomposition and hydrolysis are devoid of purgative activity, and that the purgative activity of rhubarb is due solely to the anthraglucosides and their derivatives. Rhubarb contains no other body besides the latter that has peristaltic effect on the intestinal tract. As regards the rheo-tannoglucoside, the authors are of opinion that its medicinal activity is confined to the tonic and mildly astringent effect produced on administering the drug.—Arch. d. Pharm., *240*, No. 8 (Nov. 21, 1902), 596–630.

*Rhubarb—Comparative Examination of Chinese and European Sorts.*—Dr. Sigmund Jakabhazy contributes an interesting study undertaken mainly for the purpose of definitely ascertaining whether, as is claimed by some authorities, the stellate markings (designated by Wiggers by the term "masern" = measles) on the cut or broken transverse surface of Chinese rhubarb are to be regarded as characteristic of that kind; or, if not, whether it might be possible to find any distinctive characters for Chinese and European rhubarbs. The specimens used for this investigation consisted of the rich collection of the Graz Pharmacological Institute and from local druggists, comprising forty-seven specimens of Chinese and indigenous rhubards, and besides these, numerous pieces of each of different qualities and forms of English, Austrian, French and German rhubarbs. Microscopic as well as unaided ocular examination revealed that the

rhubarbs from all of these sources, though devoid of these stellate markings in individual pieces, exhibited them in the preponderating number of specimens, Chinese as well as European. It is, therefore, evident that the star spots do not possess diagnostic value, since they are found in the root as well as the rhizome in all the commercial kinds; but their position and direction have some practical value, which the author points out. In the opinion of the author, however, the determination of the origin and quality of rhubarb is best made by an examination of its constituents. Unfortunately we have not as yet conclusive evidence as to which ingredient the therapeutic activity is due, and, therefore, do not know to which the most importance should be attached. Nevertheless there is reason to believe, as suggested by Tschirch, that the medicinal properties of rhubarb are due to the oxymethyl-anthraquinones, which are found also in senna, aloes and frangula. Chrysophanic acid (dioxymethyl-anthraquinone) and emodin (trioxymethyl-anthraquinone), therefore, play an important part in the estimation of the quality of rhubarb. In the determination of these constituents the method of Aweng has been followed—in each case the powder—one piece of each kind only being used, except of the Austrian, of which, in order to make up a uniform quantity, two pieces were powdered. The following table will show the difference between the Chinese and European rhubarbs:

| Name of Rhubarb. | Extracted by Ammoniated Alcohol. | Chrysophanic Acid. | Emodin. | Pseudo-emodin and Pseudo-frangulin. | Frangulic Acid. | Double Glucoside. |
|---|---|---|---|---|---|---|
| Shensi mundata ..... | 47.3 | 3.71 | 1.70 | 2.64 | 3.91 | 21.2 |
| Shanghai electa ..... | 39.5 | 2.92 | 1.31 | 2.33 | 3.21 | 22.3 |
| Canton electa..... | 41.2 | 3.07 | 1.43 | 2.19 | 2.87 | 19.6 |
| English, with pith ..... | 36.3 | 1.86 | 0.59 | 1.36 | 1.88 | 20.5 |
| English, free from pith .... | 33.5 | 0.80 | 0.38 | 1.21 | 1.04 | 15.3 |
| Austrian, flat, without pith. | 27.5 | 0.54 | 0.41 | 0.69 | 1.70 | 14.7 |
| Austrian, cylindrical, with pith ..... | 30.7 | 0.70 | 0.47 | 0.83 | 2.02 | 19.3 |
| French, flat..... | 31.2 | 0.74 | 0.38 | 0.68 | 1.71 | 16.4 |

From the above table it will be seen that the Chinese rhubarb exceeds the European not only in the amount of extractive matter, but also in all other constituents. The high percentage of chrysophanic acid and emodin is especially noticeable, the Shensi rhubarb showing the highest numbers, but the differences in the proportions of frangulic acid and the double glucoside is much less; the proportions of pseudo-emodin and pseudo-frangulin relatively resemble those of chrysophanic acid and emodin. It is further worthy of remark that the quantity of the individual constituents

in the European rhubarbs is not in proportion to their size, thus the hollow large pieces of Austrian rhubarb are much poorer than the solid pieces of the size of the finger. In English rhubarb from which the pith has been removed the conditions are the same. Finally, the author observes that after a trial of the method of Aweng for the determination of the active constituents of rhubarb he arrived at the conclusion that the root cannot be perfectly exhaused of oxymethyl-anthraquinone by this method. He extracted the powdered drug, not for three days, as Aweng directs, but for five days. Nevertheless the powder was not thoroughly exhausted, especially of oxymethyl-anthraquinone. When the powder so treated was dried and treated with 50 per cent. alcohol mixed with hydrochloric acid, and then boiled and evaporated on a water-bath, dried at 100°, rubbed to powder, and the powder repeatedly shaken with ether, much oxymethyl-anthraquinone was still obtainable by other treatment applied. But the fact that after the alcoholic ammoniacal extraction of the powder much oxymethyl-anthraquinone is obtained by boiling with acids, and that after the boiling in acids the percentage of oxymethyl-anthraquinone extractable with ether or benzol increases, supports the theory of Tschirch, that notwithstanding the small amount of oxymethyl-anthraquinone which can be obtained from the extract of rhubarb by shaking with ether or benzol, the activity must be ascribed to the anthraquinone derivatives, since Shensi rhubarb retains 10 per cent. of those, which may be acted upon in the alimentary canal. From Austrian rhubarb 5.3 per cent. can be shaken out by ether by this method, of which 2.9 per cent. consists of chrysophanic acid and 1.5 per cent. of emodin.—Pharm. Journ., Dec. 20, 1902, 664–666.

*Rhubarb—Peculiar Character of the Tannin.*—Besides determining the presence of gallic acid, both free and combined, together with cinnamic acid in Chinese rhubarb, E. Gilson has arrived at the opinion that the tannin of rhubarb is not a simple body, as has heretofore been assumed. He has separated from it three pure, crystalline bodies, which may be classed among the tannins, viz.:

*Glucogallin*, $C_{15}H_{16}O_{10}$, a glucoside which is split up by hydrolysis into a molecule of glucose and of gallic acid;

*Tetrarin*, $C_{32}H_{32}O_{12}$, also a glucoside, which by hydrolysis is split up into glucose, cinnamic acid and gallic acid, and

*Rheosmin*, $C_{10}H_{14}O_2$, an aldehyde, which occurs in long needles, m. p. 79.5° C., and has the strong characteristic odor of rhubarb. A fourth constituent of the rhubarb tannin is a catechin.—Pharm. Journ., Nov. 29, 1902, 549; from Rev. Pharm., *14*, 201.

## CHENOPODIACEÆ.

*Phytolacca—Comparison of Fresh and Dried Roots.*—With the object of ascertaining to what extent, if any, drugs deteriorate in the process of

careful drying, O. L. Hankins and L. E. Sayre have made a series of experiments on poke-root for this purpose, the method adopted for the investigation being as follows: The root, collected from the wild plants, was carefully cleaned and divided into two parts. One part was used immediately while the other was dried at common temperature in a well ventilated attic room. The first part—the fresh root—was grated and then comminuted to the greatest possible extent and macerated in 95 per cent. alcohol in a closed vessel and then completely extracted by displacement; the alcohol abstracting the water and preventing any decomposition occurring during treatment. The second part—the dried root—was pulverized and the water lost by drying was replaced. In other words, a quantity of water, equalling the weight of that lost in drying, was added to the powder of the dried root and the mixture allowed to macerate for 24 hours in a cool place. This was done in order to bring it to the condition fully equal to that of the fresh drug, so far as moisture is concerned. The moistened powder was then subjected to displacement with 95 per cent. alcohol until the percolated liquid was equal in amount to that obtained by extraction of the fresh root, this quantity being sufficient for complete extraction. The tincture of the fresh root and that of the dry were alike subjected to distillation at 50° C. until all of the alcohol was recovered; the residual liquid was then filtered and the filtrate dried by a mechanical stirrer and evaporation conducted so that artificial heat did not come in contact, but was blown over the surface of the constantly stirred liquid. In this manner the same treatment of the fresh root, as well as that of the dried, it was thought, should furnish three preparations, as follows: 1. An alcoholic tincture; 2, an insoluble portion precipitating after alcoholic distillation; 3, a water-soluble extract. The alcoholic distillate furnished a fourth preparation. All of these could be compared with each other. This comparison, which is described in some detail, leads the authors to the conclusion that the process of careful drying produces no material change in poke-root, although this does not prove that the root does not lose in medicinal proportion with age. The authors are also inclined to think that pharmaceutical manipulation. such as the making of fluid extract, is likely to produce changes hurtful to the preparation. In powdering the root the irritation produced in the throat and fauces was very great, the whole mucous lining being irritated. This effect was quite lasting, amounting to pain in the lungs for two weeks or more. This property, saponinoid in character, faded out in the products which were the result of manipulation.—Drug. Circ., December, 1902, 244.

*Camphorosma Monspeliaca—Characters of Volatile Oil, etc.*—Cassan has investigated the volatile oil of *Camphorosma monspeliaca*, a shrub found in the south of France, and known for its alleged camphor-like odor. The essential oil was obtained from the plant by steam distillation and ether extraction in a yield of about 0.2 per cent.; it showed the following prop-

erties: Color greenish-yellow, odor suggesting bitter almonds, specific gravity at 17° C. = 0.970, index of refraction $n_D$ 15° = 1.3724; the rotation could not be determined owing to the dark color. The oil congealed at + 4°. A series of color-reactions made with the oil gave no clue as to its constituents. It differed from the oil of the closely-related *Chenopodium anthelminticum* (which has the same specific gravity), by its pleasant odor. When distilled with aqueous potash liquor, the plant yielded a volatile base, which on examination of the platinum salt and the picrate was recognized as propylamine.—Schimmel's Rep., Oct.-Nov., 1902, 23; from "Thesis" of Author, Montpellier.

PRIMULACEÆ.

*Primulaceæ—Irritation Produced by Certain Species.*—Nessler has investigated the nature of the substances that causes the irritation produced in handling the leaves of *Primula veronica*. It is traced to the secretions which are formed in the glandular hairs, and he finds that these secretions are readily obtained by extraction and sublimation in the form of pure crystals, which give rise to throbbing and inflammation. Other species producing similar symptoms are: *Primula obconica*, *P. sinensis*, *P. Sieboldii* and *P. cortusoides*—all allied and belonging to the same natural group.—Pharm. Journ., Feb. 21, 1903, 233; from Ber. d. Kais. Akad. d. Wissensch., Wien, *111*, 27.

*Primula Grandiflora—Identity of its Characteristic Constituent, Primulite, with Volemite.*—J. Bongault and G. Allard find that the crystalline polyatomic alcohol isolated by them from the roots of *Primula grandiflora*, and at first supposed to be a distinctive compound, to which the name primulite was given, is identical in all respects with the heptatomic alcohol volemite, discovered by Bourquelot in the fungus *Lactarius volemus*. The substance is obtained from the alcoholic extract of the roots, after removal of other bodies by means of basic lead acetate, and purified by recrystallization from boiling alcohol, 75 per cent. Thus obtained, it has the formula $C_7H_{16}O$ and the rotation $a_D = + 2° 65'$; this rotation being markedly increased by the presence of sodium borate. Its ethylic acetal melts at 206° C. This figure is higher than the melting point, 190° C., assigned to volemite-ethyl-acetal, by Bourquelot. This discrepancy is, however, due to the fact that the original specimen of volemite isolated by that investigator, subsequently re-examined by the authors, was found to be inpure, probably containing traces of mannite. After purifying the original volemite of Bourquelot, it was found to give constants and derivatives agreeing in every respect with those of the volemite from *Primula*. Besides occurring in the roots of *P. grandiflora*, its presence has been detected in *P. elatior*, and in the red variety of the garden primrose. The amount present is practically the same in all species examined, 1.5 per cent. of the dried plant.—Pharm. Journ., Dec. 13, 1902, 628; from Comptes rend., *135*, 796.

SCROPHULARIACEÆ.

*Digitalis—Valuation.*—H. Ziegenbein records a comprehensive series of experiments, undertaken with the object of throwing some further light on the causes of variation in the physiological activity of digitalis leaves, as well as the discrepancies noted by various investigators between the activity of the leaves themselves and the equivalent quantity of digitoxin. The results of these experiments are exhibited in fourteen tables, showing the digitoxin content of each example examined, its toxic value as determined on frogs, the loss of the leaves on drying, the percentage of extract obtained, and from these figures the following table of comparison has been constructed.

| No. | Sample of Digitalis Leaves. | Digitoxin Content. | Toxic Value for 100 Gm. Frog Weight. |
|---|---|---|---|
| 1 | Natural Harz leaves, 1901 | 0.33 per cent. | 0.03 Gm. |
| 2 | Selected Harz leaves, 1901 | 0.163 " | 0.03 " |
| 3 | Natural South Harz leaves, 1901 | 0.14 " | 0.04 " |
| 4 | Selected South Harz leaves, 1901 | 0.185 " | 0.03 " |
| 5 | Natural Harz leaves, 1901 | 0.125 " | 0.03 " |
| 6 | North Harz leaves, 1901 | | 0.05 " |
| 7 | Natural Thuringian leaves, 1901 | 0.115 " | 0.05 " |
| 8 | Selected Thuringian leaves, 1901 | | 0.04–0.05 Gm. |
| 9 | Hessian (Rimberg) leaves, May, 1902 | | 0.06–0.075 " |
| 10 | Old (unknown source) leaves, 1900 | 0.226 " | 0.06 Gm. |
| 11 | Harz (fine powder) leaves, 1901 | 0.235 " | 0.04–0.05 Gm. |
| 12 | Harz (fine powder) leaves, 1901 | 0.18 " | 0.05 Gm. |
| | | | 1901. \| 1902. |
| 13 | Cultivated (coarse powder), 1900 | | 0.04 Gm. \| 0.1 Gm. |
| 14 | Cultivated (coarse powder), 1900 | | 0.04 " \| 0.06 to 0.075 Gm. |

The deductions drawn by the author from the results shown in the above table are, briefly stated, the following: They confirm that great variations exist in the activity of different sorts of digitalis, these variations being apparently due to locality and probably more so to the variety of the plant; that the selection of leaves and separation from inferior ones is of great importance; that the activity of the leaves on prolonged keeping is very greatly depreciated, and that of the powdered leaves even after a short period; and that the digitoxin content is not a reliable or direct index of the activity of the drug, since it has been found that the toxicity of the digitoxin obtained from a given quantity of the dried leaves, is from 2.6 to 6.6 times less intense than that of an extract of the leaves employed in corresponding quantity.—Archiv. d. Pharm., *240*, No. 6 (Sept. 10, 1902), 454–470.

*Digitalis—Necessity of a Physiological Standard.*—In continuation of experiments by which he proved physiologically that the digitoxin assay by Fromme's process is not a correct indication of the activity of digitalis

leaves, Dr. H. Ziegenbein now shows that the digitoxin residue obtained in Fromme's assay process varies in relative toxicity from 1 to 7, and it is impossible that the weight of so variable a substance can indicate the activity of the drug. Sources of error in the assay process were found first in the extraction by chloroform, by which part of the poisonous glucoside is left in the aqueous liquid, and secondly in the extraction of the drug with alcohol, which is incomplete. He found further that withered leaves are less active than well-dried green ones; that the stalk is as active as the lamina, and that the infusion was more active when prepared from a fine than a coarse powder. Purchased tinctures four years old were much weaker than a freshly prepared one. A German fluid extract possessed only one-sixth to one-seventh of the expected activity. Similar great differences were found in strophanthus tinctures, of which seven specimens were examined. Of these latter only one gave a residue which yielded a good green reaction with sulphuric acid. All these observations indicate the necessity for some method of standardization for digitalis, other than the determination of the digitoxin present, and this the author considers to have found in the time which an extract from a weighed quantity of leaves requires to stop the action of a frog's heart.—Pharm. Journ., Dec. 20, 1902, 663; Ber. d. d. Pharm. Ges., 1902, 335.

*Digitalis—Standardization of its Preparations.*—Some interesting experiments on the determination of the digitalin of the French Codex (identical with the *digitoxin* of Schmiedeberg) have been made by Ecalle, who decided on a process which was tested on a solution of digitalin mixed with an inactive dissolved extract (*Triticum repens*). 0.236 Gm. of crystallized digitalin was dissolved in 5 Cc. of alcohol at 90° and mixed with a solution of the extract in distilled water, the volume being made up to 150 Cc. This solution was treated with 25 Cc. of a 1 in 10 solution of neutral acetate of lead, and the volume made up to exactly 200 Cc. After well stirring and filtering, excess of lead was removed from the filtrate by the addition of sulphate of sodium, and the determination of digitalin proceeded with on an aliquot part of this filtrate. The solution was extracted by repeated treatment with ammonia and chloroform, the chloroformic residue redissolved in chloroform and placed in a tared beaker. To this was added a mixture of 10 parts of ether (0.720) and 70 parts of petroleum ether. The mixture was carefully shaken and left to settle, the beaker being covered with a clock glass. The clear liquid was decanted as far as possible, the remainder evaporated on a water-bath, and the residue dried by hot air and desiccation. After cooling, the beaker was weighed, and the weight of digitalin was found to be practically identical with that used.—Chem. News, March 13, 1903, 123; from Journ. de Pharm. et de Chim., *17*, 5.

*Digitalis—Assay of Commercial Powders.*—Applying the method of Keller to the assay of samples of powdered digitalis leaves in stock and

obtained from different milling companies, R. H. Hammond and L. E. Sayre obtained the following results:

*I. Powder in Stock.*

Analysis No. 1 gave 0.164 per cent. of digitoxin.
Analysis No. 2 gave 0.193 per cent. of digitoxin.
Analysis No. 3 gave 0.143 per cent. of digitoxin.
Average, 0.166 per cent.

*II. Powder from Milling Company A.*

Analysis No. 1 gave 0.432 per cent. of digitoxin.
Analysis No. 2 gave 0.416 per cent. of digitoxin.
Average, 0.424 per cent.

*III. Powder from Milling Company B.*

Analysis No. 1 gave 0.456 per cent. of digitoxin.

*IV. Powder from Milling Company C.*

Analysis No. 1 gave 0.475 per cent. of digitoxin.
Analysis No. 2 gave 0.467 per cent. of digitoxin.
Average, 0.471 per cent.

The authors, operating with 20 Gm. of the respective samples by the method explained in detail, sometimes obtained the digitoxin contaminated with fats, etc. In most cases it was purified as follows: The residue in the flask is dissolved in 3 grammes of chloroform, to which is added 7 grammes of ether, and the whole poured into 50 grammes of low-boiling petroleum ether. After shaking violently for a short time the digitoxin appears as white floccules, which quickly settle down, while the supernatant fluid becomes crystal clear. As much of the fluid as is possible is decanted off and the remaining portion is evaporated at a low temperature (not on a steam-bath). The residue is dried to a constant weight at 50° C. and weighed.—Drug. Circ., Nov., 1902, 223.

*Digitalis Leaves—Normal Percentage of Ash.*—Dr. M. Greshoff's experiments lead him to believe that the percentage of ash in digitalis leaves, which has been variously given at from 7 to 10 per cent., is too low. Leaves of undoubted genuineness, freed from sand, and after removal of the leaf stalks, were found to yield 16.4 per cent. of ash; other samples of powdered leaves from different localities yielded 21.3, 25., and 23.3 per cent., with a water content of 5.8 and 11.3 per cent. in the first two specimens, the third having been dried over quicklime. Dr. Greshoff, therefore, concludes that the ash content of digitalis leaves should be given for standardization purposes at a minimum of 15 per cent.—Pharm. Journ., Dec. 6, 1902, 601; from Pharm. Weekblad, *44*, 881.

*Digitalis Leaves—Ash-Content.*—F. H. Alcock records an ash de-

termination made with a specimen of digitalis leaves collected by himself at Yardley Wood. These leaves were B. P. in every particular. They lost on drying to air dryness 81.2 per cent., and yielded ash amounting to 1.88 per cent. calculated on the fresh leaf, or nearly 10 per cent. on the air-dried sample.—Pharm. Journ., Jan. 10, 1903, 32.

*Gratiola Officinalis—Constituents.*—Dr. Frederick Retzlaff communicates the results of an investigation of the glucosidal constituents of the herb of *Gratiola officinalis*—determined by Walz to be *gratiolin* and *gratiosolin*, in order to determine their properties and chemical relations. By a method described he succeeded in isolating these constituents in a condition of purity, but for the present confines his report on the characters and chemical relations of

*Gratiolin*, which he obtained in form of a snow-white powder, composed of fine needle-shaped crystals, sparingly soluble in water, insoluble in ether, but easily dissolved in strong alcohol. It has a bitter taste, begins to melt at 222° C., melting and becoming browned at 235° to 237°. Its composition is represented by the formula $C_{43}H_{70}O_{15}$. It is readily hydrolyzed, splitting up, by careful manipulation, with assimilation of one molecule $H_2O$ into glucose, and

*Gratioligenin*, $C_{37}H_{60}O_{10}$, a crystalline body, melting at 285°, which is tasteless, nearly insoluble in water or ether, and difficultly soluble in alcohol. Gratioligenin, when subjected to the action of diluted alcoholic hydrochloric, is in turn hydrolyzed with assimilation of 1 molecule of $H_2O$, into glucose, and

*Gratiogenin*, $C_{31}H_{50}O_5$, a body which is likewise crystallizable, melts at 198°, is soluble in alcohol, less soluble in ether, and insoluble in water. It is thus shown that the natural glucoside, gratiolin, is a diglucoside, convertible by careful hydrolysis into the primary product gratioligenin, and by prolonged action into the secondary product gratiogenin. The author has furthermore isolated from the ethereal extract of the herb a hitherto undescribed body, apparently belonging to the terpene series, which he has named

*Gratiolon.*—This forms colorless needle-shaped crystals, which are odorless and tasteless, difficulty soluble in alcohol, ether, chloroform, acetic ether and glacial acetic acid, insoluble in petroleum-ether and in water or in watery alkaline solutions. When heated it is decomposed at elevated temperatures without melting. Its percentage composition corresponds with that of camphor, but the product obtained with metallic sodium leads the author to regard its formula to be $C_{30}H_{48}O_3$.—Arch. d. Pharm., *240*, No. 8 (Nov. 21, 1902), 561–568.

*Gratiola Officinalis—Constituents.*—Imbart and Faichère have examined *Gratiola officinalis* and succeeded in extracting from the dry plant Walz's gratiolin, and a new substance gratiolinine. The latter is a

white amorphous powder, slightly aromatic in taste and free from bitterness; the empirical formula is $C_{23}H_{40}O_5$. The authors consider the existence of Walz's gratiosolin and gratiolacrine to be doubtful.—Pharm. Journ., Sept. 20, 1902, 295; from Bull. des Sci. Pharm., 4, 214.

SOLANACEÆ.

*Belladonna Fruit and Seeds—Concise Description.*—Dr. E. M. Holmes describes the fruits of *Atropa belladonna*, L., as being black, shining, nearly globular, but depressed above, and about the size of a small, black cherry. The seeds are small, blackish, about 3½ Mm. long and 3 Mm. broad, and nearly 2 Mm. thick at the wider end, slightly oblong in outline, and under a fairly powerful lens the surface appears honey-combed, although this appearance is not evident under an ordinary lens. In transverse section they present the two dots representing the coiled embryo, as shown at *d*, Fig. 41, *a* showing the seed in natural size; *b*, magnified 8 diam., and *c*, a longitudinal section. The seeds and fruits of the

FIG. 41.

Belladonna Fruit and Leaves.

*Garden Nightshade, Solanum nigrum, L.*, are also briefly described. The small, black globose berries are about the size of a large pea and contain seeds almost identical in size and appearance with those of *Dulcamara* (which see).—Pharm. Journ., Jan. 3, 1903, 5.

*Belladonna Leaves—Assay.*—W. A. Puckner observes that while it is well known that the mydriatic alkaloids are easily decomposed during the process of their isolation, analysts are much in doubt as to the conditions under which such decomposition occurs. In view of this uncertainty he has therefore made some investigations in this direction with belladonna leaves in the hope of throwing some light upon this subject. He applied for this purpose two methods—the one in which the powdered leaves were shaken out direct with chloroform-ether (1 vol. chloroform to 4 vols. ether) and ammonia water, then percolating with additional chloroform-ether, receiving the percolate in a separator containing some 1 per cent. sulphuric acid, shaking out the percolate with this and additional acid, rendering the acid liquid alkaline with ammonia water, and shaking this out with chloroform in the usual manner—finally titrating the residue of evaporation of the chloroform solution. The second method consisted in extracting the powdered leaves with a menstruum of 67 Cc. alcohol and enough water to make 100 Cc., concentrating the percolate, adding ammonia water, shaking out with chloroform, then the chloroform solution with dilute acid, and treating this then as in the first experiment. The results of these experiments showed that in the assay of belladonna leaves

*no loss of alkaloid need be feared through the evaporation of a hydro-alcoholic percolate.*

The author next made a series of experiments to ascertain whether, as is claimed, the recovery of the volatile solvent (chloroform) by distillation occasioned any loss of alkaloid—the practice being to sacrifice this material, as well as much time, by resorting to spontaneous evaporation. His results show that with *due care recovery of chloroform by distillation does not occasion loss of alkaloid.*

Finally, it seemed possible that the wide variations between results obtained by different methods are caused by the varying amount of ammonia used or the variable length of time. The author's detailed experiments show that, although long contact with ammonium hydroxide does decompose the alkaloids, yet it does so to so small an extent that *no loss of alkaloid through action of ammonium hydroxide is likely to occur* in the course of an estimation made under ordinary conditions.—Pharm. Rev., Oct., 1902, 457–463.

*Belladonna Root—Percentage of Alkaloid.*—John Barclay reports that the figures obtained by the assay of belladonna root during the year prove that those obtained last year, viz., 0.54 per cent. by weight and 0.47 per cent. by titration, are representative of a root of good commercial quality, the actual figures obtained being 0.52 and 0.46 respectively. A sample of English root grown at Stratford-on-Avon gave 0.39 per cent. alkaloid by weight, 0.34 per cent. by titration, these latter figures being considerably lower than those obtained by an examination of a root grown in the south of England examined and reported upon last year.—Pharm. Journ., Jan. 24, 1903, 97.

*Belladonna Root—Commercial Quality.*—The usual standard for the alkaloidal content of belladonna root is 0.5 per cent. Robert C. Pursel and Willard Graham have examined and assayed eight different samples and obtained the following figures (by titration) : 0.57, 0.54, 0.58, 0.58, 0.54, 0.55, 0.54, 0.55. These results show that the commercial root during the past year answered the above requirement.—Proc. Pa. Pharm. Assoc., 1902, 146.

*Belladonna Root—Inferior Quality.*—H. G. T. Gardner calls attention to a consignment of belladonna root, from an apparently reputable source which on examination proved to be very inferior in quality. In addition to the roots having been steamed to increase their weight, it was found on examination that at least two-thirds of their bulk consisted of roots other than those fulfilling the pharmacopœial requirements, and were young spring and old roots. Such an admixture is a serious matter, because both these kinds of roots contain a smaller proportion of alkaloid than the root collected in the autumn when three or four years old. To the naked eye the young spring root is less in diameter than the root possessing the most

medicinal value. Cut transversely with a sharp penknife, its section is not whitish, as it should be, nor is it starchy in appearance. The dark cambium ring is present, but the central portion is brown, varying in color from a light to dark brown, almost indistinguishable from the color of the cambium ring, and containing whitish specks. The old root, on the other hand, is of a white color, broken towards the periphery of the central portion by one or two yellow bands of strongly lignified cells. The microscopic features and characters of distinction are also given and shown in cuts accompanying the author's paper.—Chem. and Drug., Jan. 17, 1903, 89.

*Capsicums and Chillies—Varieties in French Commerce.*—Guillard, in a work entitled "Les Piments des Solanées," gives illustrations and descriptions of the different varieties of capsicum and chillies of French commerce. He classifies the different cultivated varieties of capsicum according to the shape of the fruit and the character of the pedicel, whether straight or curved. The paprika, or sweet capsicum, appears to correspond to a form of the author's *Capsicum annuum*, var. *grossum*, and the ordinary Natal and Indian capsicums to a form of the var. *acuminatum*, which he erroneously describes as "Anglice;" Chilli pepper, or chillies, and the Nepal capsicum, or as he calls it, "Chilli Nepal," correspond to a shorter form of the same variety, while Coconada and cherry capsicums correspond to the var. *cerasiforme*. The chillies of French commerce are derived from Cayenne, Hanoi, Tahiti, Diego Suares, Konakry and Tourane, and a large form, Noumea, in New Caledonia.

*Japanese Chillies—Structural Distinction from Capsicum Annuum and C. Minimum.*—In a previous paper (see Proceedings 1902, 829) T. Edward Wallis gave a description of the anatomical character of distinction between the fruits of *Capsicum annuum* and *C. minimum*, but expressed the opinion that no attempt should be made to formulate a paragraph suitable for insertion into the B. P. until the structure of Japanese chillies, which are found in the market in large quantities, had also been determined. This work he has now completed, his observations and results being given in a detailed description, accompanied by cuts showing the anatomical structures of the Japanese fruits, from which the following may find place here:

Japanese chillies are very similar in general appearance to the fruits of *Capsicum minimum*, from which, however, they differ in various particulars. The fruits have usually no stalk; they are rather more plump, of a larger average size (15 to 25 Mm. long and 5 to 7 Mm. in diameter in the widest part), and have a much brighter red color than the official variety. Each pod contains from ten to twenty-five unripe, pale-yellow, flat seeds, which have an average size slightly smaller than the seeds of *C. minimum*. The structure of Japanese chillies is substantially the same as that of *C. annuum*. There are, however, certain differences, particularly in the struct-

ure of the pericarp, which enable one readily to distinguish the two varieties microscopically. The distinguishing features in the three species of Capsicum under consideration are shown in the following summary, which gives the essential characters of the epidermis and hypoderma of the pericarp:

| | C. Minimum. | C. Annuum. | Japanese Chillies. |
|---|---|---|---|
| *Epidermis.* | Thick and straight-walled rectangular cells with few pits; often arranged in groups of five to seven in a row and with a uniformly striated cuticle. Size of cells, 25$\mu$ to 60$\mu$ in either direction. | Irregular polygonal cells with evenly-thickened walls, traversed by numerous well-marked, simple pits. The cuticle shows striated ridges. Size of cells, 60$\mu$ to 100$\mu$ long, and 25$\mu$ to 50$\mu$ wide. | Cells with strongly thickened walls and a radiated lumen. The pits only rarely penetrate the whole thickness of the wall. No visible striation. Size of cells, 30$\mu$ to 80$\mu$ long, and 15$\mu$ to 45$\mu$ wide. |
| *Hypoderma.* | Delicate thin-walled cellulose cells. | Several layers of cuticularized collenchymatous cells, having a rounded outline and very few pits. | A single layer of regular polygonal cells with cuticularized, fairly-thick walls, traversed with numerous pits, which give them a beaded appearance. |

The author concludes that it is quite possible to exclude the unofficial variation of *capsicum*, used as a substitute or admixture of the official *powdered* drug, if some paragraph, such as the following, is included in the Pharmacopœia:

When examined microscopically, the pericarp shows an epidermis formed of thick and straight-walled rectangular cells which have few pits, are often arranged in groups of five to seven in a row, and have an evenly striated cuticle.—Pharm. Journ., July, 1902, 3, 4.

*Capsicum—Determination of Constants.*—Beythien has determined the water, ash, alcoholic extract, ether extract, nitrogen and crude fibre in thirty-two samples of capsicum fruits (ground-paprika), which were found to have the following ranges:

| | | |
|---|---|---|
| Water | 7.79 to 13.52; | mean 10.03 |
| Ash | 5.35 to 7.86; | mean 6.34 |
| Ether extract | 12.54 to 19.70; | mean 14.97 |
| Alcoholic extract | 26.55 to 35.71; | mean 28.94 |
| Nitrogen | 2.19 to 2.55; | mean 2.42 |
| Fibre | 21.10 to 26.80; | mean 23.37 |

It is interesting to note that ether extracts nothing from the drug after exhaustion with alcohol. Beythien regards the amount of alcoholic extract as the most important factor for determining the presence of exhausted

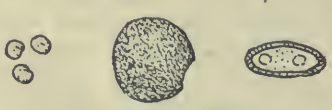
capsicum. As the samples purchased were already ground, the quality of the drug used could not be determined; hence the above figures only show the variation in commercial samples of ground capsicum, and cannot be accepted as a basis for determining a standard.—Pharm. Ztg., Nov. 29, 1902, 549; from Zeitsch. f. Nahrungs. und Genussm., *5*, 858.

*Capsicums—Presence of Starch.*—Having occasion to examine a sample of cayenne pepper, alleged to contain a "trace of ginger," J. C. Stead was struck with the fact that while in the suspected sample starch granules similar to those of ginger were easily distinguished under the microscope, in especially ground peppers, to which from 1 to 2 per cent. of ginger had been added, no indication of these could be obtained. On further investigation it appeared that with freshly ground peppers some constituents, presumably in part oil and resin in an unoxidized state, masked the granules, and also either chemically or mechanically, or possibly in both ways, prevented staining with iodine. Even with some extracted capsicums in which starch could easily be seen without staining, the granules, when stained blue-black with iodine, soon became colorless, and some slides after standing showed violet and colorless granules side by side. Six samples of capsicums were now taken, the seeds separated, ground and passed through a 30 sieve; the remainder of the fruit was in each case similarly treated. Equal quantities of the powders were extracted with chloroform, dried, and treated with water so as to separate the starch by gravitation. All contained starch. These are shown in half-tone illustrations, together with those of a series of ginger—Jamaica, Cochin, African and Japanese—both in a stained and unstained condition. The capsicums, which are also shown in illustration, were the following: Long Bombay; Madras (2 samples); Natal cherries; and Japanese chillies.—Chem. and Drug., June 20, 1903, 1000–1001.

*Capsicum—Improvement of Poor Qualities of the Powder.*—Seigelis calls attention to a method of manipulating powdered capsicum with oil, by which poor qualities are improved in appearance, and thus bring better prices.—Pharm. Ztg., 1903, 118; from Œster Chem. Ztg., 1902.

*Dulcamara Fruit and Seeds—Concise Description.*—Dr. E. M. Holmes describes the berries of the woody nightshade, *Solanum Dulcamara*, as being red and oval, like those of black bryony (which see under "Dioscoreaceæ"), but are not quite as large, and contain much smaller seeds. The latter are yellowish-white, somewhat lens-shaped or slightly reniform, 4 to 5 Mm. broad, but only 1 Mm. in thickness, appearing smooth under an ordinary lens, but minutely reticulated under a powerful one. The transverse section shows two round dots, indicating where the

FIG. 42.




Dulcamara Seed.

curved cylindrical embryo has been cut across at either end. The seed (Fig. 42) is shown in natural size at *a*, magnified 4 diam. at *b*, and in tranverse section at *c*.—Pharm. Journ., Jan. 3, 1903, 5.

*Dulcamara—Active Constituents of the Fruit.*—Frederick Davis has determined that the fruits of *Solanum Dulcamara* contain solanine, solanidine, solanein and dulcamarin. He isolated the two alkaloids in a crystalline state and described their characters, showing also that solanidine exists in the plant chiefly in the leaves and young shoots. He found commercial solanine to be a mixture of solanine and solanidine, which are distinguishable by a difference of 30 degrees in their melting points, that of solanine being 235° C. (insoluble in alcohol) and of solanidine 205° C. (soluble in alcohol). They did not reduce Fehling's Solution, although the textbooks absurdly say of solanine "it is at once an alkaloid and a glucoside," and that solanidine is the result of the hydrolysis. On the other hand the author proved that solanein and dulcamarin are glucosides, the former splitting up on hydrolysis into the alkaloid solanidine and glucose.—Trans. Brit. Pharm. Conf., 1902, 491–493.

*Hyoscyamus Muticus—Feasibility and Advantage of Cultivation.*—J. B. Nagelvoort calls attention to the feasibility of growing the Egyptian hyoscyamus, *Hyoscyamus muticus*, in a temperate zone. Seed, personally obtained from Egypt, has grown to small plants, promising well under different conditions,—in sand, in poor sandy soil, and in common garden soil, in the United States as well as in Holland. The cultivation of this species of *Hyoscyamus* would be a pleasing solution to our dependency on European henbane, *Hyoscyamus niger*, ariving, as it often does, in a very poor condition for pharmaceutical purposes—mouldy, blackened, and low in alkaloidal content. Moreover its high alkaloid content—Gadamer (1898) found 1.4 per cent. and Dunstan and Brown (see Proceedings, 1901, 676) found 0.87 per cent. of hyoscyamine—is a decided advantage, since European henbane has been found to yield only 0.1 per cent. or less of alkaloid.—Amer. Journ. Pharm., Sept.. 1902, 418, 419.

*Hyoscyamus Muticus—Alkaloid Content.*—A parcel of Egyptian hyoscyamus leaves—presumably derived from *Hyoscyamus muticus*—examined by the chemists of Southall Brothers and Barclay, gave a percentage of total alkaloid corresponding to 0.66 per cent. by weight, this confirming the results obtained by Dunstan and Brown. Mr. John Barclay suggests that this drug might turn out to be of considerable value, having in view how much more alkaloid it contains than the English drug—a sample of the latter, of their own drying, yielding only 0.09 per cent. (by titration) when examined by the chemists of his firm.—Pharm. Journ., Jan. 31, 1903, 135.

*Stramonium Seed—Characters of Fixed Oil.*—D. Holde has examined the fixed oil of stramonium seeds. He extracted 16.7 per cent. by means

of benzol, and found that the alkaloids were not simultaneously removed. A thin layer of the oil dried at 50° C. to a firm varnish, but at ordinary temperatures it remained liquid for days. In addition to daturic acid other acids were isolated and are now being examined. It may be observed that in 1865 Clöez obtained 25 per cent. of fixed oil from the seeds. —Pharm. Journ., Jan. 24, 1903, 90; from Königl. techn. Versuchsanst., Berlin.

*Tobacco—Source of Aroma.*—Frankel and Wogrinz confirm the statement of Hermbstaet that the aroma of tobacco is due to a volatile basic substance, which he named

*Nicotianine*, and not to nicotine or the alkaloids isolated from tobacco by Ticket and Rotschy. The authors have isolated nicotianine from the milky aqueous distillate of tobacco leaves in the form of

*Nicotianine Picrate.*—This salt occurs in brilliant, silky, yellow needles, melting at 214° C., and sparingly soluble in water and in alcohol.—Pharm. Journ., Oct. 25, 1902, 412; from Monatschefte, through Journ. Pharm. Chim. (6), *16*, 273.

OLEACEÆ.

*Olive Oil—Commercial Quality.*—Seventy-seven samples of olive oil have been examined during the year in the laboratory of Southall Brothers and Barclay, the majority of which have proved genuine. The amount of free acid varied from 0.67 to 14.1 per cent.; but in the opinion of this firm no oil can be regarded as suitable for pharmaceutical use which contains more than 4 per cent. of free acid. A series of experiments made with Tolman's modification of Becchi's test serves, in the opinion of this firm, no useful purpose. It was found that where the Becchi reagent is freshly prepared no difference in results between the original and the modified tests was observable.—Pharm. Journ., Feb. 7, 1903, 164.

*Manna—New Constituents.*—C. Tanred has isolated from manna two new sugars which he calls manneotetrose and manninotriose. *Manneotetrose*, $C_{24}H_{42}O_{21}$, is obtained by first eliminating the mannite. This is done by dissolving manna in half its weight of boiling water, and adding sufficient spirit to bring the alcoholic strength of the solution to 70 per cent., in which, in the cold, mannite is but sparingly soluble. After standing, the precipitated mannite is filtered out, and the alcoholic filtrate concentrated. The residue is extracted first with 95 per cent. alcohol, then with 85 per cent., both boiling, until the insoluble portion attains a rotation of about $[a]_D = +140°$. This residue is dissolved in water, purified with basic lead acetate, excess of that salt removed with $H_2SO_4$, and the lead-free filtrate treated with pure $Ba(OH)_2$, and precipitated with 80 per cent. alcohol. The barium compounds of the sugars thus thrown down are

collected and the sugars liberated by means of $CO_2$, when the two sugars are obtained in a state of relative purity. They are then separated by fractional precipitation with $Ba(OH)_2$ and 80 per cent. alcohol. Ultimately, two extreme fractions are obtained, one consisting of 75 per cent. of manneotetrose and 25 per cent. of manninotriose, the other of 77 per cent. of manneotetrose or 3 per cent. of manninotriose. The solution, rich in manneotetrose, gives a gummy residue on spontaneous evaporation. But if sown with a trace of the sugar in a crystalline state, obtained by evaporating a little of the sugar solution to dryness on the water-bath, with constant stirring, crystallization starts; when complete, the crystalline mass is treated with 70 per cent. alcohol, drained on the filter pump, and dried in the air. Recrystallized from water, it contains 4.5 molecules $H_2O$. It is hydrolyzed by acids into 4 molecules of monoses, viz., 2 molecules of galactose, 1 molecule of levulose, and 1 molecule of glucose, according to the equation—$C_{24}H_{42}C_{21} + 3H_2O = 4(C_6H_{12}O_6)$. It melts at 167° C., and is dextrogyre, having the constant $[a]_D = +133° 85'$ for the hydrated sugar. If it has not been previously heated, it does not reduce Fehling's Solution, but in the presence of the least trace of moisture it becomes hydrolyzed. By mineral acids hydrolysis is effected in two stages. At first 1 molecule of $H_2O$ is taken up, forming levulose and the new sugar manninotriose; then manninotriose in its turn combines with 2 molecules $H_2O$, forming 2 molecules of galactose and 1 molecule of glucose. With acetic acid only the first reaction takes place, also with organic hydrolyzing ferments. It is not precipitated by neutal or basic lead acetate, but with ammoniacal lead acetate forms the lead salt, $C_{24}H_{34}Pb_4O_{21}$. It is partially fermented by yeast. *Manninotriose*, $C_{18}H_{32}O_{16}$, as stated above, is found accompanying manneotetrose in manna; it is probably derived from the hydrolysis of the former, either spontaneously or by the action of a natural ferment. It is best obtained by hydrolyzing the mixture of the two sugars with acetic acid; after removing the acid by shaking out with ether, the aqueous portion is concentrated, extracted with boiling 90 per cent. alcohol; the solvent is distilled off, and the residue redissolved in just sufficient boiling 80 per cent. alcohol. After purification by repeated resolution and cooling in 80 per cent. alcohol, it is decolorized with animal charcoal, and redissolved in boiling absolute ethyl or methyl alcohol. Thus obtained, it forms slightly birefringent globules, having the $[a]_D = +167°$. It softens at about 150° C., is soluble in water in all proportions, and reduces Fehling's Solution. It is oxidized by bromine into manninotrionic acid, $C_{12}H_{32}O_{17}$, which, when heated with dilute acid, combines with 2 molecules $H_2O$, forming 2 molecules of galactose and 1 molecule of gluconic acid.—Pharm. Journ., Sept. 6, 1902, 254; from Comp. rend, *134*, 1586.

*Privet Fruits and Seeds—Concise Description.*—Dr. E. M. Holmes describes the fruits of privet, *Ligustrum vulgaris*, as being small black berries,

FIG. 43.


Privet Seeds.

about the size of a small sweet-pea seed. The seeds (pyrenes) are oblong-elliptical in outline, plano-convex, black, smooth, about 8 Mm. long, 5 Mm. wide, and 3 Mm. thick. On transverse section the seed is seen to consist chiefly of albumen, the embryo forming a linear-elliptic white spot in the centre. Fig. 43 shows the seed in natural size at *a;* magnified 4 diam. at *b;* and in transverse section at *c*.—Pharm. Journ., Jan. 3, 1903, 6.

LABIATÆ.

*Bystropogon Origanifolius, L'Hérit—Characters and Constituents of Volatile Oil.*—Schimmel & Co. call attention to an oil which they received from L. Rigal, of Arona Cristianos, Teneriffe. The oil is obtained from *Bystropogon origanifolius*, a shrub often met with in the Canary Islands, and whose odor was very similar to that of oil of pennyroyal. This oil has a bright yellow color, and shows the following constants: Specific gravity, 0.9248 (15° C.); optical rotation, + 2° 27′; acid number, 0; saponification number, 11.1, after acetylation, 53.83; index of refraction, $N_D$ 1.48229. The oil distilled between 162° and 234° C., is soluble in 2½ volumes of 70 per cent. alcohol, in 0.7 volumes of 80 per cent. alcohol, and consists chiefly of pulegone and menthone, with a small content of limonene.—Schimmel's Rep., Oct.–Nov., 1902, 82.

*Coleus.—Species Bearing Edible Tubers.*—Attention is directed to several species of *Coleus* bearing edible tubers, of which

*Coleus tuberosus* is cultivated in Java, Ceylon and the Malayan Archipelago,

*Coleus edulis* in Abyssinia, while

*Coleus barbatus* grows in India and tropical Africa.—Pharm. Journ., Jan. 10, 1903, 29; from Annales de l' Institut Colonial.

*Peppermint—Effect of Mineral Salts on the Development of the Plant.*—In continuation of their experiments on the influence of mineral salts as fertilizers for peppermint, E. Charabot and A. Hebert have now shown that mineral salts which have been applied to the soil in the neighborhood of a plant, effect a reduction in the water-content of the latter. The experiments were made with the peppermint plant, which was submitted to the action of common salt, calcium chloride, sal ammoniac, the sulphates of sodium, potassium, ammonium, iron and manganese; the nitrates of sodium, potassium and ammonium, and di-sodium phosphate. The most powerful action is exerted by nitrates, especially sodium nitrate; the least powerful by di-sodium phosphate.—Compt. rend., *136* (1903), 160.

*Plectranthus—Species Bearing Edible Tubers.*—The genus Plectranthus furnishes several tuberous vegetables.

*Plectranthus floribundus*, found in tropical Africa, is known as the Kaffir potato. *Plectranthus ternatus* is grown in the Transvaal under the name of matambala. Another species, *Plectranthus coppini*, has been imported from the Soudan, where it was cultivated by the Bambara tribes. It was introduced to the French colony of Tongking by Professor Cornu, and seems likely to be established as a useful vegetable to take the place of potatoes, which do not thrive in a tropical climate.—Pharm. Journ., Dec. 27, 1902, 695 ; from Bulletin de la Soc. bot. de la France [4], 1,107.

BORRAGINACEÆ.

*Anchusa Tinctoria—Characters of Red Coloring Matter.*—According to A. Gawalowski the red coloring matter of alkanet root consists of two distinct bodies, the one turning blue, the other green by the action of alkalies. The first of these, which he names

*Alkannic acid*, is extracted by ether-alcohol. The second,

*Anchuric acid*, is obtained by extraction with benzol. Both form characteristic colored salts.—Pharm. Ztg., 1902, 817 ; Oester. Zeit. f. Pharm.

CONVOLVULACEÆ.

*Jalap—Experimental Results with Different Methods of Assay.*—A. B. Lyons reviews the different official (U. S. P. and B. P.) and other methods that have been prepared and used, and points out their respective merits and deficiencies. He outlines these methods in the following and gives the results in the table appended. In A the drug was exhausted with alcohol, the alcoholic tincture concentrated, an equal volume of water added and evaporation carried to dryness ; the residue then washed repeatedly with water, dried and weighed. In B the powder was first exhausted with ether, then with alcohol ; the assay being finished as in A. In C the powder was exhausted first with ether, then with a mixture of chloroform and alcohol, the second percolate shaken with water as described above. In D the powder was exhausted with ether, then with alcohol, chloroform added to the alcoholic percolate, and the mixture then shaken with water. In E, Alcock's amylic-alcohol method was used. In F the drug was exhausted by percolation first with ether, then with acetone. The acetone solution was evaporated to a volume of about 15 Cc., an equal volume of water added, and the whole evaporated to dryness. The residue was then treated exactly as in method A. The results of the several methods, it will be noted, are reasonably concordant, method D occupying a little less time than any of the others. By using 10 Gm. of powdered drug one may make two or three assays by methods B and D, employing aliquot parts (20 Cc. or more) of the alcoholic percolate for the several determinations. If one result or the other is low, the reason for the discrepancy will generally be obvious. In method B see to it that the water solution that is rejected carries with it no detached particles of resin, and that the resin

that remains is translucent and of a uniform amber color. In method D, distrust the result if any emulsification takes place in shaking out with water. In such case the upper stratum of fluid as well as the lower should be evaporated to dryness, and the residue of the former should be treated with water.

| Method. | Ether-soluble Resin. | Ether-insoluble Resin. | Total Resin. | Total Extract. |
|---|---|---|---|---|
| A..... | —— | —— | 9.42 per cent. | —— |
| B..... | 1.25 per cent. | 8.15 per cent. | 9.40 " | 13.11 per cent. |
| C..... | 1.27 " | 8.20 " | 9.47 " | 10.83 " |
| D..... | 1.26 " | 8.18 " | 9.44 " | |
| D..... | 1.27 " | 8.34 " | 9.61 " | |
| E. ... | 1.24 " | 8.33 " | 9.57 " | 11.24 " |
| F..... | 1.27 " | 8.23 " | 9.50 " | 11.85 " |

The same principles of assay may be applied to galenical preparations of jalap.—Pharm. Rev., Febr., 1903, 61–65.

BIGNONIACEÆ.

*Bignonia Catalpa—Character of Acid Constituents of the Pods.*—According to A. Piutti and E. Comanduci, the acid isolated by Salvatore Sardo from the fruit pods of *Brignonia catalpa*, to which the formula $C_{14}H_{14}O_6$ was attributed, and which was named catalpic acid, is in reality a paraoxy-benzoic acid, $C_7H_6O_3$. The authors have also isolated from the unripe fruits a substance melting at 188° to 190° F., which is a compound of paraoxy-benzoic and proto-catechuic acid, $C_7H_6O_3.C_7H_6O_4 + H_2O$—a compound heretofore obtained by Hlasiwetz and Barth by fusing benzoin with KOH.—Chem. Centralbl., *73*, (2), 50; from Bull. Chim. Farm.

GENTIANACEÆ.

*Gentian—Changes in the Dried Root.*—E. Bourquelot and H. Hérissey point out that a mere comparison of the fracture of fresh and dried gentian root is sufficient to demonstrate how great has been the chemical change in its constituents. That of the fresh root is white, while the inner portion of the dry root is brownish-red. If the process of drying be carefully conducted, this change does not ensue rapidly. But since the root with deep-colored fracture is preferred by druggists this is rapidly brought about by exposing the root, before it is completely dried, to a kind of fermentation. To effect this, the roots, about eight or ten days after gathering, are heaped together. The mass becomes heated and is turned over from time to time, so that complete drying is not accomplished until all the pieces have acquired the desired reddish tint. Gentian root which has undergone this treatment yields much less extractive than that which has been carefully dried. The difference amounts to as much as 27 per cent. Examination of the powder of the commercial dried root shows

that the sucrose, gentianose and gentiopicrin, originally present in the fresh root, have almost disappeared, while the aqueous extract prepared from the dried root contains none of these original constituents. The powder contains, besides the hexoses, glucose and levulose, which also exist in the fresh root, those which are formed by the action of a ferment on the sucrose, gentianose, and gentiopicrin of the fresh root. It also contains a little gentiobose in the free state. The aqueous extract contains only hexoses and gentiobiose, the latter contributing slightly to the bitter taste of the preparation. Although the yield is small, it is easier to prepare gentiobiose from either the powdered root or from its aqueous extract than from the fresh root, since, in the former, the accompanying gentianose has been entirely split up and removed, while from the latter both sugars are removed together, and are then extremely difficult to separate. —Pharm. Journ., Feb. 21, 1903, 234; from Journ. Pharm. Chim. [6], *16*, 513.

*Gentian—Adulteration with the Rhizomes of another Species.*—Vogl draws attention to the admixture of the rhizomes of *Gentiana asclepiadea* with that of *Gentiana lutea*, both in the sliced and powdered state. In the sliced root it may be detected by the presence of numerous, unusually small, woody pieces, and in the powder by the abundance of lignified prosenchymatous elements and stone cells, the genuine powder containing scarcely any lignified elements other than large reticulated vessels. In this connection the author mentions that, contrary to the statement of Solereder, calcium oxalate has been found by him in a number of gentianaceous plants, and particularly in the genus *Gentiana*.—Oester. Ztsch., 1903, 141.

*Quinine Flower—Antiperiodic Value.*—Dr. J. Dabney Palmer, of Monticello, Florida, directs attention to the "quinine flower."

*Sabbatia Elliottii*, a small, herbaceous and pretty plant, which grows in the open pine woods as far north as South Carolina, makes its appearance in March or April, and flowers from August to October. It is from twelve to eighteen inches high, with alternating branches from near the base. The leaves are rather light green, small, and sessile; the lowest are obovate, and the upper, linear. The flowers are about the size of a dime, milk-white, with a yellow center, and scattered on long peduncles. The roots are brown and fibrous. The whole plant has the peculiar, permanent bitter taste of quinine, and, during the war between the States, was used as a substitute for quinine. It is a curious fact that persons brought under its influence experience sensations such as tension or fulness in the head, ringing in the ears, or partial deafness, just as when under the influence of quinine. This peculiarity suggested its name, and the results of its use proved that it had the same physiological effect as quinine. It is also serviceable as a bitter tonic in dyspepsia, and in convalescence from

fevers. The best time for gathering it is during the flowering season. In making a tincture, the whole plant should be used. It is to be dried in the shade, ground, then four ounces of it added to a pint of diluted alcohol allowed to macerate one or two weeks, with occasional shaking, and filtered. Dose, one or two teaspoonfuls three or four times a day.—Merck's Rep., April, 1903, *96*.

APOCYNACEÆ.

*Condurango—Specific Test for Its Preparations.*—Firbas recommends the following distinctive test for condurango in its galenical preparations: The fluid extract, for instance, is freed from alcohol by gently warming, and the crude glucoside, condurangin, precipitated by the addition of a saturated solution of sodium chloride. The precipitate is shaken with chloroform, which dissolves the condurangin, and then mixed with a liquid consisting of equal volumes of sulphuric or hydrochloric acid and alcohol. On warming the mixture assumes a green color, which turns a beautiful greenish-blue on the addition of a trace of ferric chloride. This reaction, which is known as Lafon's, is given by adonidin, oleandrin, sapotoxin and digitoxin, none of which, however, is likely to be present.—Oester. Ztschr., *41*, 57.

*Dregea Rubicunda—Characters and Constituents of the Seeds.*—W. Karsten has examined the seeds (fruits) of *Dregea rubicunda* recently received from Ugago. They are 12 to 17 Mm. long, 10 to 12 Mm. broad and 1 Mm. thick, almond-shaped, smooth, grey-brown or green, and differ in their externals considerably from strophanthus seeds. A cross-section touched with conc. sulphuric acid assumes a red-brown color, passing to brown. An amorphous glucoside, amounting to 2.5 per cent., was isolated from these seeds. It is soluble in water, alcohol, benzol and glacial acetic acid, less soluble in ether and insoluble in petroleum ether. The glucoside has a burning taste, becoming bitter and nauseous. It is hygroscopic, turns yellow when exposed to the air, melts at 85° C. (at 107° when anhydrous) and differs from strophanthin both chemically and in its toxic action.—Apoth. Ztg, 1902, 770; from Ber. d. d. Pharm. Ges., 1902, 245.

*Gelsemium Elegans*, Benth.—*A Highly Poisonous Burmese Species.*—Sir Dietrich Brandis calls attention to *Gelsemium elegans*, Benth, having received pieces of the roots, stems, leaves and flowers of this plant from Upper Burma, with the following significant remarks by the sender, Mr. Smales: "Very deadly creeper; decoction of root kills instantly; leaves also fatal." Sir Dietrich states that in consequence of the death of two persons from suspected poisoning by this plant, the Government Analyst detected an alkaloid in the stomach contents, as well as in the tea which they had drunk, which showed reaction similar to those given by gelsemine and strychnine. The plant is a large creeper, having bright yellow flowers, the samples sent were collected at an altitude of 3200 feet.—Pharm. Journ., June 27, 1903, 868.

*Strophanthus Root—Characters and Constituents.*—Karsten has had an opportunity to examine the root of *Strophanthus hispidus*, D. C., which he finds to attain over a meter in length by from 2 to 3 Cm. in thickness. Here and there it divides into equal branches, and at intervals of 1 to 4 Cm. it is constricted either on one side of the root only or entirely round it. The transverse section exhibits a thick cork covering of a greyish cortex. The latter affords with sulphuric acid a transient bluish-green coloration. Chemical investigation showed that it contained trigonelline and choline, together with a small proportion of strophanthin, the same constituents, therefore, as have been found in the seeds, but the proportion of strophanthin is so small that there appears little prospect of the root being employed as a substitute for the seeds.—Ber. d. d. Pharm. Ges., *12* (1902), 241.

*Strychnos Rheedii—Presence of Brucine and Absence of Strychnine in the Seeds.*—W. R. Dunstan has made a chemical examination of the seeds of *Strychnos Rheedii*, obtained from Quilon, Travancore, and found them, when dry, to yield 0.06 per cent. of brucine, but no strychnine, by methods previously used in the examination of the seeds of *Strychnos nux vomica*. —Pharm. Journ., Sept. 27, 1902, 315; from Imp. Inst. Rep. for 1901–2, 29.

*Tu-chung Bark—A Possible Source of Rubber.*—Dr. E. M. Holmes states that "tu-chung bark," valued as a tonic by the Chinese, is remarkable for containing an abundance of a kind of india rubber, although curiously enough it is not used by the Chinese as a source of that product. Fifteen years ago the tree yielding it was absolutely unknown. It is now growing in the Royal Gardens at Kew, is being cultivated in France, and can apparently be cultivated with success in a temperate climate. When the bark is broken across, numerous silky fibres can be drawn out for an inch or more, but they do not show much elasticity. In any case the bark should be worth growing for the Chinese market, where it brings a high price.—Pharm. Journ., May 23, 1903, 705.

*Indo-Chinese Rubber—Plants Suitable for Cultivation.*—Dr. Pierre directs attention to the following trees of Indo-China as worthy of cultivation as sources of india rubber, viz.: *Ecdysanthera tournieri*, Pierre, the "Mac Khao-ngoua" of the natives; *E. quintareti*, Pierre, having the same native name as the first, but differing in its oblong-linear leaves tapering at both extremities, in being pubescent and covered beneath with brown points formed by the glandular base of fallen hairs; *E. godefroyana*, Pierre, which has narrower and longer leaves than *E. quintareti*, and twelve to seventeen pairs of secondary veins, whilst *E. tournieri* has only eight or ten. *E. napeensis*, Pierre, the "Katang Katiou" of the natives, has oval-elliptical leaves, suddenly rostrate, or rounded below, and having four to five secondary veins. *E. linearicarpa*, Pierre, the "Mak sang

Dua Khai," or ergots de coq, of Laos; *E. cambodiensis*, Pierre, found in the province of Kamput. *Xylinabaria reynaudi*, Jum., with oval leaves rounded at the base, and having five pairs of secondary veins, called "Giay rêt in Thai nguyen;" *Parameria glandulifera*, Benth., common also in the Philippines and Malaya, and *P. griffithii*, R. Wight; but Dr. Pierre gives no particulars as to the character of the rubber of the different species, nor the amount yielded by them.—Pharm. Journ., Nov. 29, 1902, 550; from Revue des Cult. Colon., *11*, 225–229.

*Rubber—Influence of the Mode of Coagulating the Latex on the Quality.*—In view of the generally accepted notion that the mode of coagulation may affect the general purity of the rubber produced, its color, percentage of occluded water, and general suitability, but that it has no influence upon the intrinsic quality of the india-rubber itself, C. O. Weber, in the "India-rubber and Gutta Percha Trades' Journal," submits the following points which he believes have an important bearing upon the quality of the rubber produced from a latex: (1) It is extremely doubtful, if not altogether improbable, that rubber as such pre-exists in the latex, but merely a substance capable of agglomeration by polymerization. (2) That being conceded, and the results of a careful chemical and microscopical study of the latex leave very little room for doubt on the point, it is at once obvious to those familiar with the peculiar physico-chemical phenomena known as polymerization that the properties of the product of the coagulation of the latex, the quality of the india-rubber produced, is not one-sidedly determined by the species of the tree furnishing the latex, but is capable of variation between wide limits. (3) The nature of that variation must therefore be determined by the physical, but even much more by the chemical conditions observed in the carrying out of the coagulation process. So far the truth of that has been recognized only in regard to the physical conditions observed, the variation of the quality of the rubber produced due to specific and definite chemical conditions has hardly been recognized yet otherwise than in the crudest fashion, and it has not yet been made the object of systematic investigation.—Pharm. Journ., Nov. 29, 1902, 596.

*Castilloa Rubber—Varieties of Tree Yielding It, Collection and Properties.*—Dr. C. O. Weber communicates some interesting information concerning *Castilloa* rubber. The latex is contained in laticiferous vessels, which run longitudinally, and a clear spiral cut around the trunk is, therefore, found to be the most satisfactory method of obtaining the largest amount of milk. By ordinary methods of coagulation the rubber contains $\frac{9}{13}$ per cent. of albuminous substances, which are apt to become putrid. It has been found that if the latex is diluted with five times its volume of water, strained through cotton gauze into well-washed petroleum barrels, and to each full barrel 8 ozs. of formaldehyde be stirred in, the coagulation of the albuminous substances is prevented, whether hot or cold water be used, and the rubber separates after twenty-four hours as a white mass of

such strength and tenacity that it can be lifted entire from the barrel. This crude rubber is porous and needs to be cut into strips and well washed and dried. The strength of the rubber so prepared is said to be superior to that of Para rubber. It yields only 2.6 per cent. of resinous matter, 0.044 per cent. of ash, and no albuminous or insoluble constituents. Dr. Weber has also shown that the amount of resin present is greater in young trees than in older ones, lessening from 42.33 per cent. in a two-year-old tree to 7.21 per cent. in one eight years old, and in different parts of the tree from 7.50 in the leaves to 3.77 in the large branches, down to 2.61 in a large trunk. It increases in quantity from the root upwards. He advises that the trees should, therefore, not be tapped until they are eight years old. It appears also that there are three varieties of the tree, distinguished by the color of the bark. The best (alba) has a whitish bark of yellowish or pinkish tint; it is the hardiest kind, produces a creamy latex, and yields the largest quantity of rubber. Of the other two kinds, one (nigra) has a dark, rough bark, yields a thin milk, and may easily be bled to death by tapping. The other (rubra) has a smooth, reddish bark without the longitudinal furrows present in the alba and nigra; it yields a small quantity of latex and the rubber is not good.—Pharm. Journ., Feb. 21, 1903, 234; from India-Rubber and Gutta Percha Trades Journal.

*Rubber—Plants Producing it in the French Congo.*—The species of *Landolphia* which are found in the French Congo differ, according to A. Chevalier, from the more general liane type, and produce a very large rhizome, from which aerial stems of one or two years' duration arise, often remaining herbaceous, and never developing tendrils. Of the three forms, *Carpodinus lanceolatus*, which grows around Stanley Pool, has been wrongly described as a caoutchouc-producing plant, since its latex only yields resin on coagulation. Of the other two, *Landolphia humilis* and *Landolphia tholloni*, only the latter yields rubber of commercial value, and this is obtained, not from the aerial branches, but from the old parts of the rhizomes. The rhizomes and roots form an interwoven plexus where the plant is well developed, and there present a latent source of considerable value. The author also states that the cultivation of foreign rubber-producing plants in the public gardens in Senegal, French Guinea, and the Congo has not been attended with success. The climate in Senegal is too dry for the Ceara rubber plant, *Manihot glaziovii*, and also for *Hevea brasiliensis*, and *Castilloa elastica*. In French Guinea and the Congo they show very rapid growth, but so far the rubber yielded has been of an inferior quality.—Pharm. Journ., Dec. 27, 1902, 695; from Comptes rend., *125*, 441 and 512.

*Senegal Rubber—Botanical Sources.*—H. Hua has attempted to clear up the confusion with regard to the best rubber trees of Senegal. He points out that while *Landolphia senegalensis* has been given as the source of good rubber, the real source is *Landolphia heudelotti*, D. C. This tree is

known in Senegal as "Toll," in the Soudan as "Goin," and in Guinea as "Fae," while *Landolphia senegalensis* is known in Senegal as "Madd" and in the French Soudan as "Taba." According to the author's investigations there are four useful rubber-yielding species in the French African colonies, namely, *Landolphia heudelotti*, *L. klainii*, *L. pierrei* and *L. humilis*.—Pharm. Journ., Jan. 24, 1903, 89; from Rev. des Cult., *xi*, 322–328.

*South American Caoutchouc—Botanical source.*—Huber refutes the idea of Warburg that *Hevea braziliensis*, the tree which supplies the best Para rubber, is a native of Venezuela, and also disposes of the suggestion that there are two varieties, which has arisen in connection with the local names *Seringuiera blanca* and *Seringuiera preta;* these refer to the different appearance of the same tree when grown in the open or in the interior of the forest. *Hevea braziliensis* is spread throughout the whole region of the Amazon, and has been traced as far as the Peruvian effluents of the Javari. Other species of the genus are *Hevea guyonensis*, which occurs locally in the East, *H. spruceana* more widely spread, and *H. lutea*, which is found on the banks of the river Ucayale in the West. Of these only the last yields rubber of any value. Other genera referred to are *Castilloa elastica*, which supplies the "caucho" of the Peruvians and is spread throughout the Amazon valley, and species of *Sapium*, which do not promise to yield good rubber.—Pharm. Journ., Nov. 29, 1902, 550; from Bulletin de la Soc. bot. de France, *49*, 43.

*Rubber—Possibilities of Abundant Supply from Siam.*—The British Consular Assistant at Bangkok, Mr. Carlisle, reports that there is undoubtedly a future for an abundant supply of rubber from Siam. It is known that rubber-producing trees are found in some quantity in certain parts of that country, notably in the eastern provinces, but little is known at present of the product or the possibility of cultivation, though inquiries in that direction are now being prosecuted by the Siamese Ministry of the Interior. —Pharm. Journ., Nov. 29, 1902, 596.

*Rubber.—Cultivation in Burmah.*—In view of the vast strides in electrical science, and the consequent increased demand for india rubber, which bids fair to exceed the supply, it is interesting to note that the Indian Government proposes to plant 10,000 acres in Burmah with *Hevea braziliensis*, which yields the well-known Para rubber, esteemed to be the best kind.—Pharm. Journ., Jan. 24, 1903, 89; from Gard. Chron., *32*, 400.

*Caoutchouc—Occurrence in Several Species of Eucalyptus.*—J. H. Maiden directs attention to the occurrence of caoutchouc in the leaves of several species of *Eucalyptus*, and particularly in *E. corymbosa* L. It is present in small quantity, but it is a common occurrence to see boys pull the leaves apart to see the elastic threads.—Pharm. Journ., June 27, 1903, 868; from Gardu, Chron., *33*, 361.

*Gutta Percha—Cultivation in Sumatra.*—Burchard recommends the following method for cultivating gutta-percha plants in Sumatra: Young saplings, of about the diameter of a lead pencil, are placed horizontally on the soil and pinned down until they have sent up shoots three or four inches in height, and roots have formed beneath them. The stem is then cut on either side of the shoot at the distance of about one and a half inches, and the young plant put in damp, clayey soil in a new place, avoiding too much shade. The plants are slow of growth.—Pharm. Journ., Aug. 2, 1902, 85; from Rev. des Cult. Coloniale, *11*, 66.

*Gutta Percha—Analysis.*—H. Bornträger has made examinations of gutta percha, using the following method: 1. *Water.*—Desiccation of 2 Gm. of material at 100°. 2. *Impurities.*—One Gm. of the raw gutta percha was treated with 50 Cc. of boiling benzene for twelve hours. This was passed through a tared filter and the residue weighed, after washing and drying at 110°. 3. *Pure Gutta Percha.*—The benzenic solution containing the gutta, the fluavil and the albane, is concentrated to 50 Cc., and precipitated with 100 Cc. of absolute alcohol. After boiling for two hours it is filtered, and the residue dried at 100°, and weighed. 4. *Albane.*—The separate estimation of this substance not being of any technical importance, the sum of the fluavil and the albane is generally determined by difference. However, these two bodies can be separated by concentrating the benzenic solution, containing an excess of alcohol, down to 50.Cc. The albane, insoluble in alcohol, is precipitated on cooling; the decanted solution contains the fluavil. After evaporation and desiccation at 80°, these two bodies are weighed. According to the author, albane is formed of three almost equal portions, of which the first two distil over at 200° and 250°. The results obtained with a typical sample of raw gutta percha by this method were as follows: Water, 1.5; impurities, 2.5; pure gutta percha, 77.5; fluavil, 6.0; albane, $a_1$, 3.8; albane, $a_2$, 3.7; albane, $a_3$, 5.0 per cent.—Chem. News, Oct. 24, 1902, 210; from Ztschr. Anal. Chem., *39*, 502.

*Gutta Percha—Method of Estimation.*—Dr. Ed. Markwald and Fritz Frank have experimented with a number of methods proposed for the estimation of the amount of gutta percha in crude gutta percha—three of these depending on the solution of the gutta in chloroform and precipitation by acetone (*A*), alcohol (*B*) and ether (*C*), respectively, the fourth one on the solution in warm petroleum ether (*D*) and its separation on cooling. They found *A*, *C* and *D* to give fairly concordant results, but for reasons of convenience and for economy of solvent, prefer the process *A*, which is carried out, after determining the water in the sample, by the new method, as follows:

About 2 Gm. of dried gutta are dissolved in 15 cubic centimeters of chloroform, and the clarified solution is poured, very gradually and with constant stirring, into 75 cubic centimeters of acetone in a tared Erlen-

meyer flask. The gutta separates in the form of a voluminous porous precipitate, which can be collected and washed with ease. The resins and fats remain dissolved, the mechanical impurities remain in suspension. After decantation into another tared flask, the gutta is washed with acetone and the liquors all added together. The gutta is dried at 100° and weighed; the resins are treated in the same manner. If we wish to weigh the insoluble impurities, in the estimation of a raw gutta, for example, the filtration must be done through a tared filter-paper. It will be observed that the acetone must not be poured into the chloroform solution, as in such a case the gutta would separate in a compact mass, retaining the resins which could not be entirely removed by the subsequent washings. The resulting errors amount to 5 per cent.—Chem. News, June 5, 1903, 266; from Ztschr. Ang. Chem., 1902, 1029.

*Balata Gum—Source of Production.*—J. A. Bonty has found that the tree yielding balata gum, *Mimusops balata*, is abundant in the valley of the Amazon, where the inhabitants were ignorant of its yielding this substance. He states that the balata trees grow scattered and in groves, sometimes amounting to forests many miles in extent, all over the states of Para and Amazonas, and is informed that vast areas of the trees grow on the banks of the Purus and Acre rivers, and other tributaries of the Upper Amazon. The trees are said to yield three and a half pounds of balata each, and a skilled operator can prepare forty to fifty pounds in a single day. The latex is first fermented and then dried in the sun, and is then ready for shipment.—Pharm. Journ., Feb. 21, 1903, 234; from Imp. Inst. Journ., *8*, 305.

STYRACEÆ.

*Benzoin—Assay of Commercial Samples.*—Robert C. Pursel and Willard Graham have examined and assayed during the year a number of samples of benzoin, which, as it occurs in commerce to-day, varies considerably in appearance, while "good" and "fine" Sumatra benzoin is usually very scarce. The results of their assay gave the following figures:

| Marked. | Sol. in Alc. | Vol. matter. | Insol. matter. | Sapon. No. | Acid No. |
|---|---|---|---|---|---|
| Sumatra, fancy.... | 91.8 | 3.4 | 4.8 | 258.5 | 125.5 |
| Sumatra A..... | 90.2 | 5.2 | 4.6 | 274.4 | 120.5 |
| Sumatra B..... | 85.9 | 4.0 | 11.1 | 272.3 | 110.5 |
| Sumatra C..... | 77.5 | 3.2 | 19.3 | 274.4 | 110.5 |
| Sumatra D..... | 84.6 | 4.5 | 10.9 | 274.4 | 120.5 |
| Siam A..... | 93.2 | 5.4 | 1.4 | 268.2 | 120.5 |
| Siam B..... | 93.2 | 3.0 | 3.8 | 274.5 | 120.3 |
| Palamberg..... | 87.4 | 4.4 | 8.2 | 268.5 | 110.5 |
| Not marked ..... | 82.5 | 6.7 | 10.8 | 268.8 | 110.4 |
| Average..... | 87.3 | 4.4 | 8.3 | 270.4 | 116.5 |

—Proc. Pa. Pharm. Assoc., 1902, 146.

*Benzoin—B. P. Requirement too High.*—John Barclay reports that in the laboratory of his house ten samples of Sumatra benzoin have been examined, and the following figures show the mean results obtained :

| | |
|---|---|
| Solubility in 90 per cent. alcohol | 69.89 per cent. |
| Free balsamic acid calculated as benzoic | 9.17 per cent. |
| Combined balsamic acids calculated as benzoic | 10.03 per cent. |

As the result of experience his firm has come to the conclusion that the B. P. standard of "almost entirely soluble in alcohol (90 per cent.)" must be altered if the Sumatra variety is to keep its place as an official drug. Better, however, than any standard for the crude drug would be the plan of standardizing the preparations into which it enters. Their experience of good commercial Sumatra benzoin shows it to contain an average of about 70 per cent. of soluble matter, and to yield by our method about 20 per cent. of balsamic acids calculated as benzoic, not much less than half of which is present in uncombined condition. In making the compound tincture a drug of this quality would yield up to it a proportion of the balsamic acids which go to make up the total percentage of those acids which they have suggested should be adopted as a standard.—Pharm. Journ., Jan. 24, 1903, 97.

ERICACEÆ.

*Vaccinium Myrtillus—The Fruit a Specific Remedy in Typhoid Fever.*—Dr. Max M. Bernstein announces before the Hunterian Society that he found the whortleberry or bilberry (*Vaccinium Myrtillus*) to be a specific remedy against typhoid fever and other infectious intestinal diseases. It is claimed that the juice of the fruit has extraordinary bactericidal properties towards the typhoid bacillus, cholera vibrio, and other pathogenic organisms of the intestines. Since whortleberries or bilberries are quite harmless, the preparations made from them may be administered in any doses. So far, only the "jam" of the fresh fruit, and what the author names, indifferently, a decoction and infusion of the dried fruit, 1 : 1, appear to have been used. Although the number of cases reported on is small, marked success has so far attended the treatment, so that the matter is worthy of full investigation.—Brit. Med. Journ., *1*, 1903, 306.

*Vaccinium Vitis-Idaea—Constituents of the Leaves.*—A. M. Karger has re-investigated the leaves of the cowberry, *Vaccinium vitis-idaea*, with the following results : The chief constituents found were arbutin, hydroquinone, tannin, quinic acid, ericolin, ericinol, gallic and probably ellagic acid, the two last named being probably products of the decomposition of the tannin. Arbutin, hydroquinone and tannin increase in quantity during the summer, and reach their maximum in the autumn. As these may be regarded as the most important of the constituents, the leaves should be gathered in September, and they should be dried at the ordinary temper-

ature, as they suffer change if heated. The flowers contain hydroquinone, but not benzoic or salicylic acid. Benzoic acid is, however, present in the fruit. Bearberry leaves being closely allied to cowberry leaves, both botanically and chemically, it is quite probable that these also should be gathered in the autumn.—Pharm. Journ., Jan. 3, 1903, 1 ; from Chem. Ztg.

COMPOSITÆ.

*Calendula—Remedial Value.*—T. A. Mosely states that there are few pharmacopœial products possessing as much remedial value as calendula preparations, and, although official, it has not come into very extensive use. In his experience there have been many instances where injuries from a nail in the foot, cutting with glass, bruises and all wounds from whatsoever cause have been instantly relieved by constant application of tincture of calendula, keeping the parts well moist with same. Homeopathic pharmacists consider calendula preparations of much value, and prepare an ointment, an oil and a collodion, to which the author adds a formula for "Glycerinated Calendula" and "Compound Marigold Liniment" (which see under "Pharmacy").—Proc. Mo. Pharm. Assoc., 1902, 60–61.

*Chamomile Flowers—Isolation of a Thysosterin.*—See *Anthesterin*, under "Organic Chemistry."

*Chrysanthemum—Wild Forms in China and Japan.*—Dr. Henry, who has collected specimens now in the Kew herbarium, states that there are two wild forms of *Chrysanthemum* which may be considered the progenitors of the cultivated strains. Throughout China and Japan the form known as *Chrysanthemum indicum*, which has a yellow ray, is widely spread, while in the mountains of Hupeh there occurs a form with white or pink rays, which has been called *Chrysanthemum morifolium.* Another series of plants obtained in North China and Japan has been considered to show merely a variation of the second form, and this is accepted by Dr. Henry, who points out the possibility of finding intermediate varieties in the unexplored districts in the interior of China.—Pharm. Journ., Dec. 29, 1902, 695 ; from Gard. Chron., *31*, 301.

*Helichrysum Italicum—Substitution of the Flower-heads for Insect Flowers.*—Hockauf has microscopically examined the flower-heads of *Helichrysum italicum*, which have been offered as insect-destroying flowers. They may be distinguished from the genuine by the absence of the T-shaped hairs, fewer bast-fibres and sclereids, and by the presence of pappus-hairs and characteristic glands.—Œster. Ztschr. f. Pharm., 1903, 82.

*Lachnanthes Tinctoria—Proximate Examination.*—J. A. Gardner records the results of a proximate examination of *Lachnanthes tinctoria.* Starting with an extract prepared with 70 per cent. alcohol, the alcohol was removed, the extract precipitated with lead acetate and the precipitate decomposed by hydrogen sulphide. The aqueous filtrate yielded

on evaporation a syrup which was soluble in alcohol or in acetone, the acetone solution being deep-red and yielding a deep-red, brittle, shellac-like solid on spontaneous evaporation. The lead sulphide precipitate was dried and yielded to ether a small quantity of a red solid, while the residue yielded to acetone a small quantity of a yellow, deliquescent substance. The mother liquor, on spontaneous evaporation, left a red syrup which constituted the bulk of the extract. After extraction with ether, the lead sulphide precipitate yielded to 94 per cent. alcohol a red, crystalline substance, whilst the mother-liquid dried to a red, tarry matter, soluble in acetone. The filtrate from the lead acetate precipitate gave a precipitate with lead subacetate, and that, in turn, was decomposed by hydrogen sulphide. After filtration, the aqueous filtrate was found to contain the bulk of the resinous matter set free; a small part of the residue left on evaporating the filtrate was not soluble in alcohol and was recrystallized from water. The bulk of the alcoholic extract was soluble in water, the solution yielding on evaporation a brittle, yellow, deliquescent, amorphous solid, which was insoluble in chloroform, contained no nitrogen, and did not reduce Fehling's Solution. The lead sulphide precipitate yielded a red, viscous substance and some crystalline matter to ether and alcohol, while the filtrate from the lead subacetate was also found to contain crystalline matter, soluble in alcohol. It appears from these results that *Lachnanthes tinctoria* contains one or more substances of a resinous nature, as well as crystalline bodies which may possibly prove to be of alkaloidal nature.—Pharm. Journ., July 19, 1902, 43; from Lancet, July 12, 1902, 72.

*Lacinariæ—Reputed Value of Different Species as Antidotes to Serpent Venom.*—L. C. Lewis calls attention to the reputed values of different species of *Lacinaria*—particularly *L. scariosa, L. squarrosa* and *L. spicata*—as antidotes to the bites of serpents, the three plants being known in this reference as "Rattle-snake's Master." The author, after discussing the properties of these plants as given in the literature, mentions that the late Dr. John Johnston, of Tuskegee, Ala., has used a decoction of these plants for the treatment of the bites of venomous reptiles with satisfactory results.—Proc. Ala. Pharm. Assoc., 1902, 23–25.

*Safflower—Yield of Fixed Oil from Fruits.*—It is stated in "Westnik Shirow Weschsch.," that the fruits of the safflower, which is cultivated in the Russian Government of Saratow, where the plants are used for dying silk, contain about 25 per cent. of fixed oil, and yield 19 per cent. by pressure. The oil resembles that of sunflower seed.—Chem. Ztg., 1902.

*Santolina Chamæcyparissus—Use of the Herb as an Abortifacient.*—Hockauf states that the herb of *Santolina chamæcyparissus*, L., is successfully used as an abortifacient in Styria. This property of the plant has not before been recorded, and it is possible that inquiry may show its use to be more extensive than at present appears.—Oester. Ztschr., *41*, 82.

RUBIACEÆ.

*Coffee—Outline of History and Commerce.*—William B. Marshall has written an admirable sketch, entitled "The History and Commerce of Coffee," his subject being presented under the following captions: I. Botany; II. The Plant; III. Geography; IV. Cultivation; V. Preparation for Market; VI. Commerce; VII. Chemistry; VIII. Effects; IX. Competition; X. Adulterants and Substitutes; XI. History of the Uses of Coffee. —See Amer. Journ. Pharm., Aug., 1902, 361–374.

*Coffee—Variation of Caffeine Content According to Source and Species.* —In determinations recently made by Bertrand, he shows that there is considerable variation in the percentage of caffeine in coffee berries from plants cultivated in different countries, and also in the percentage found in the berries of other species than *Coffea arabica.* In the former case percentages varying from 0.69 to 1.60 were found. Of species other than *C. arabica, C. canephora* was found to be the richest in alkaloid, the berries yielding 1.97 per cent., whilst those of *C. humboltiana* were remarkable by reason of their containing a bitter principle, cafamarin, but no caffeine at all. The berries of *C. mauritiana* contained only 0.07 per cent., and, therefore, these species may be regarded as yielding berries practically free from caffeine. This fact is of some importance, as there is a demand for a beverage that shall have the agreeable aromatic taste of coffee, but be devoid of the stimulating effect due to the presence of caffeine.—Pharm. Journ., Dec. 6, 1902, 601; from Bull. des Sciences Pharm., *4*, 280.

*Roasted Coffee—Separation and Characters of Volatile Oil.*—Erdmann has obtained a volatile oil from roasted coffee by extracting the aqueous distillate with ether. It has the specific gravity 0.844, contains nitrogen, and possesses the aroma of the coffee in a high degree. The greater part of this oil passes over during fractional distillation between 150° and 190° C., decomposition beginning above the latter temperature. The acid distillate obtained by fractionation contains from 39 to 42 per cent. of valerianic acid. This was removed by shaking with pure sodium carbonate, leaving an oil which on fractionation yielded 50 per cent. of furfurol. The residue contains the nitrogenous bodies referred to, and has the aroma of coffee to an intense degree. The author furthermore finds that on roasting a mixture of caffeine, sugar and caffeo-tannic acid, similar products are obtained possessing a coffee-like aroma. The peculiar odor of coffee is attributed by the author to the nitrogenous bodies mentioned, and not, as stated by Berheimer, to the presence of a phenol.—Pharm. Ztg., 1902, *47*, 459.

*Ipecacuanha—Alkaloidal Content and Standardization.*—G. Ferichs and N. de Fuentes Tapis record the results of a comprehensive investigation undertaken for the purpose of establishing the identity and character of

the alkaloids of ipecacuanha. They confirm the existence of the three alkaloids, emetine, cephaeline and psychotrine, as previously shown by Paul and Cownley, and also the correctness of the formulas assigned by the latter chemists to emetine and cephaeline, namely, emetine, $C_{30}H_{44}N_2O_4$; cephaeline, $C_{28}H_{40}N_2O$. The formula of Kunz-Krause for emetine is obviously incorrect, because he operated upon a mixture of emetine and cephaeline. Since the valuation of ipecacuanha root necessarily depends on the relative proportion of the three alkaloids contained in it, the method for its assay must be re-investigated, and the authors are now engaged in this task in order to decide upon the most suitable process of standardization.—Arch. d. Pharm., *240*, No. 5 (July 25, 1902), 390.

*Ipecacuanha—Improved Method of Valuation.*—In a second paper the authors, after reviewing and criticizing the various methods that have been suggested for determining the value of ipecacuanha, propose the following method, which is an adaptation of the suggestion recently made by Paul and Cownley in their paper on Indian ipecacuanha (see below). In the proposed method the small percentage of psychotrine, which is believed to be medicinally almost inert, is ignored, since its determination would necessitate the weighing of the alkaloid, because of the difficulty to titrate the psychotrine. The authors, therefore, consider it sufficient to determine the total amounts of emetine and cephaeline, which is accomplished by agitating 6 Gm. of the finely powdered root for one hour with a mixture of 60 Gm. ether and 5 Cc. ammonia solution, or in place of the latter, 5 Cc. of sodium carbonate solution (1 : 3), then adding 10 Cc. water and evaporating 50 Gm. of the ether solution (= 5 Gm. of the drug) to one-half, after filtering, shaking that liquid out with 10 Cc. decinormal hydrochloric acid and washing it twice with 10 Cc. water. The acid liquor diluted to 100 Cc. is then titrated with decinormal potassium hydrate in the presence of a layer of ether, using iodeosin as an indicator. One cubic centimeter of decinormal hydrochloric acid is taken as being equal to 0.0241 gramme emetine and cephaeline, corresponding to the mean of 248 and 234. Instead of titrating the alkaloid as described, the acid solution may be shaken out with ether and ammonia, the ether residue being dried at 100° C. and weighed; or the dried residue may be titrated; but as a slight decomposition always occurs on drying these sensitive bases, giving rise to a strongly colored solution, the titration is not in that case very distinct. The authors describe a method for the separation of emetine and cephaeline which is practically the same as that proposed by Paul and Cownley in 1896 (see Proceedings, 1896, 579). Furthermore, they mention that both emetine and cephaeline dissolve in Fröhde's reagent almost without any coloration; but if then a trace of hydrochloric acid or sodium carbonate is added to the solution, an intense indigo-blue coloration is produced in the case of cephaeline, while in the case of emetine there is no perceptible coloration produced.—Arch. d. Pharm., *240*, No. 6 (Sept. 10, 1902), 401–.

*Ipecacuanha—Percentage of Alkaloid in Cultivated Indian Drug.*—Dr. B. H. Paul and A. J. Cownley have had the opportunity of examining a sample of Indian ipecacuanha, and the analytical results obtained are interesting as giving evidence that the preponderance of emetine over cephaeline is not confined to the Bolivian variety, to which they called attention some time ago (see Proceedings, 1901, 699–703). The sample examined yielded: Emetine, 1.39 per cent. (= anhydrous emetine hydrochloride, 1.59 per cent.); cephaeline, 0.50 per cent.; psychotrine, 0.09 per cent. The separated alkaloids had all the characters the authors have described as appertaining to them in the paper above referred to. They point out that the Indian ipecacuanha resembles the Bolivian rather than the Columbian variety of the drug, and that for pharmaceutical preparations, where the emetine contents may form the basis of

*Standardization of Ipecacuanha*, the Indian kind appears to be equal to the Bolivian—though, eventually, it may be ascertained that cephaeline is of some significance and to the advantage of the Columbian. Furthermore, in the analysis of ipecacuanha precaution is necessary not only to ensure complete extraction of the alkaloids, but their satisfactory separation so that they may correspond to the tests for purity in the manner previously described by the authors (see Proceedings, 1896, 579). There should be no difficulty in the matter of analysis if it is borne in mind that ether will extract the whole of the emetine and cephaeline and that chloroform is unnecessary except for psychotrine, which in a Pharmacopœia preparation of Rio ipecacuanha is hardly worth consideration. A liquid extract, for example, if made decidedly acid, then diluted well with water and cleaned with ether, will yield, when shaken out with ether and ammonia, a residue from ether which is in a fit condition for titration with decinormal hydrochloric acid. The result when expressed as emetine is sufficiently accurate for the purpose of the pharmacist, and he will find no difficulty in making an analysis by this method. Operating in that way upon 20 cubic centimeters of a liquid extract, the quantity directed by the B. P. to be taken for standardizing, the ether residue obtained for titration would not be less than 0.4 Gm. If the pharmacist has prepared the liquid extract the quantity of alkaloid found might be taken as that of ipecacuanha without need of identification; but in the case of a bought preparation some further test might be desirable. Unfortunately the reactions of emetine as well as those of cephaeline are not sufficiently characteristic for the purpose of identification, and the reactions of a mixture of the two bases, such as would be obtained in standardizing, are even less distinctive. Probably the best method of identification would be to observe the crystallization of the emetine hydrochloride obtained after separating cephaeline, also to ascertain the insolubility of the greater part of the alkaloid in caustic alkali as well as the ready solubility of the undissolved portion in ether and the precipitation of cephaeline from the caustic alkali solution

on adding some ammonium chloride. By that means some indications may be obtained, as to the relative proportions of emetine and cephaeline, that would show whether Brazilian or Columbian ipecacuanha had been used. Chloroform is a very unsatisfactory solvent in alkaloidal determinations, and ether should be substituted when possible. At the same time, if psychotrine is to be determined, then the ammoniacal liquid, after being extracted by ether, must be shaken out with chloroform.—Pharm. Journ., Sept. 6, 1902, 256, 257.

In a second paper the authors observe that the amount of alkaloids in ipecacuanha root is a subject that has at length been receiving some attention from continental chemists and drug merchants since their chemistry and pharmacology have been placed on a more scientific basis than was formerly the case. It still seems, however, to be considered in many quarters sufficient to use the knowledge acquired, merely as a means to ensure complete extraction of the alkaloids rather than to make an attempt to individualize the two principal alkaloids, by a proper separation. In our present knowledge of the subject it is not sufficient to know with accuracy the total amount of alkaloids in the root, but the relative proportions of at least two of the alkaloids should be ascertained. If emetine is to be regarded as the most important alkaloid for medicinal purposes, then the root must be accurately assayed for emetine. On the other hand, the same consideration must be maintained if cephaeline or psychotrine should eventually be found efficacious to any extent. It is contrary to all the existing scientific work to attempt to value ipecacuanha root on the basis of the amount of total alkaloid. With regard to psychotrine the determination is best carried out, at present, by weighing the chloroform residue, in the manner already indicated by them. They mention also that they have succeeded in obtaining crystallized psychotrine hydrochloride from an acid solution of the salt. The results of analyses are, however, not sufficiently concordant to warrant their publication.—*Ibid.*, Sept. 27, 1902, 317.

*Ipecacuanha—Ash Determinations.*—A. G. C. Paterson, in view of the desire expressed by the General Medical Council for information relating to the percentage of the ash of various crude drugs, selected ipecacuanha as one of the most suitable for investigation in this direction, since this drug has in recent years aroused considerable attention from the work done upon its histology, assay and alkaloidal constituents. Preliminarily the author mentions the variability in the quality of the genuine Brazilian and Carthagena drug, due to admixture of considerable portions of stem, as well as of earthy matter, sand, etc., and to the adulteration of the powdered drug or the substitution of the genuine drug by a number of other roots and rhizomes, which are exposed for sale under the name of ipecacuanha. Moreover, not inconsiderable quantities of ipecacuanha root, especially of the Carthagena variety, arrive in a very dusty and dirty

condition, and would probably yield an ash containing an appreciable amount of sand. All of these varying conditions and possibilities were taken into consideration in the ash determinations made by the author, the portion of ash insoluble in hydrochloric acid being calculated as sand present in the sample. The results are tabulated by the author as follows:

BRAZILIAN IPECACUANHAS.

| Number and Nature of Sample. | Percentage of Moisture. | Ash. | Insol. in HCl. | Sol. in HCl. |
|---|---|---|---|---|
| 1. Picked roots, Rio | 11.34 | 1.86 | 0.21 | 1.65 |
| 2. " " " | 11.79 | 3.22 | 0.51 | 2.71 |
| 3. " " " | 11.29 | 3.00 | 0.37 | 2.63 |
| 4. Brazil. ipecac. (wiry and stemmy) | 10.68 | 3.02 | 0.44 | 2.58 |
| 5. " " (lean and stemmy) | 12.11 | 2.81 | 0.36 | 2.45 |
| 6. " " (inferior, dusty and stemmy) | 11.22 | 3.8 | 1.15 | 2.65 |
| 7. " " (stem, same bale as No. 2) | 10.72 | 3.6 | 0.41 | 3.19 |
| 8. " " (mouldy root) | 12.43 | 3.00 | 0.18 | 2.82 |
| 9. " " (stem) | 10.62 | 2.82 | 0.42 | 2.4 |
| 10. Indian ipecac. (cultivated) | — | 2.54 | 0.163 | 2.38 |
| Average | 11.35 | 2.96 | 0.421 | 2.54 |

CARTHAGENA IPECACUANHAS.

| Number and Nature of Sample. | Percentage of Moisture. | Ash. | Insol. in HCl. | Sol. in HCl. |
|---|---|---|---|---|
| 11. Picked fine root | 11.77 | 2.45 | 0.51 | 1.94 |
| 12. Inferior root | 11.19 | 3.9 | 1.09 | 2.81 |
| 13. Inferior root | 11.00 | 4.76 | 1.45 | 3.31 |
| 14. Poor small dusty root | 11.12 | 5.95 | 1.59 | 4.36 |
| 15. Very dusty and mouldy root | 11.71 | 5.1 | 1.68 | 3.42 |
| 16. Poor dusty root | 11.44 | 3.66 | 1.04 | 2.62 |
| 17. Stem from fine sample | 12.15 | 4.78 | 1.48 | 3.3 |
| Average | 11.43 | 4.37 | 1.26 | 3.11 |

IPECACUANHA SUBSTITUTES.

| Number and Nature of Sample. | Percentage of Moisture. | Ash. | Insol. in HCl. | Sol. in HCl. |
|---|---|---|---|---|
| 18. Cryptocoryne spiralis, E. I., Fine clean root | — | 4.24 | 0.646 | 3.594 |
| 19. Psychotria emetica | — | 4.75 | 0.917 | 3.833 |
| 20. Ionidium ipecacuanha | — | 4.5 | 0.289 | 4.211 |
| 21. Richardsonia scabra | — | 5.71 | 0.6 | 5.11 |
| Average | — | 4.8 | 0.613 | 4.187 |

COMMERCIAL POWDERED IPECACUANHAS.

| Number and Nature of Sample. | Percentage of Moisture. | Ash. | Insol. in HCl. | Sol. in HCl. |
|---|---|---|---|---|
| 22. Brazilian powder | 12.12 | 2.9 | 0.5 | 2.4 |
| 23. " " | 10.62 | 3.3 | 0.75 | 2.55 |
| 24. " " | 11.03 | 2.87 | 0.445 | 2.425 |
| 25. Carthagena powder | 10.3 | 8.95 | 4.18 | 4.77 |
| Average | 11.01 | 4.50 | 1.47 | 3.03 |

The results of this investigation, taken in conjunction with others previously published, show that—

(1) The determination of the total ash yielded by powdered ipecacuanha gives but a very slight clue to the nature of the drug powdered.

(2) That the presence of more than 1 per cent. of sand generally indicates a dusty or otherwise objectionable root.

(3) That the microscopical characters of the powders, whilst excluding many substitutes and impurities, do not satisfactorily allow of Brazilian root being distinguished from Carthagena.

Characters that will probably admit of the Carthagena powder being distinguished from the Brazilian must be looked for in the differences in constituents contained in these roots, more particularly the proportion of cephaeline and emetine.—Pharm. Journ., March 14, 1903, 387–389.

*Ipecacuanha—Commercial Quality of Brazilian Roots.*—John Barclay reports the results of the examination of 28 samples of Brazilian ipecacuanha. The average percentage of alkaloid varied from 1.89 to 2.55, or an average percentage on the whole samples of 2.29. A sample of *Johore ipecac* gave 2.36 per cent. of alkaloid, and since this variety is said to contain the two alkaloids in the same proportion as does the Brazilian root, there does not appear to be any reason why it should not be used for making the official preparations.—Pharm. Journ., Jan. 31, 1903, 135.

CAPRIFOLIACEÆ.

*Elder Seeds—Concise Description.*—Dr. E. M. Holmes describes the seeds (endocarps) of elder, *Sambucus nigra*, L., as being linear oblong and rounded at the ends, about 8 Mm. long, 4 Mm. broad and 2 Mm. deep, of a brownish color externally, and marked with numerous tubercles. The transverse section shows the linear outline of the cut embryo surrounded by the fleshy albumen. Although the berries in size and color resemble those of privet (which see under "Oleaceæ") they are globular, and there is no difficulty in distinguishing the seeds, which are shown

FIG. 44.


Elder Seeds.

in natural size at *a*, Fig. 44, magnified 4 diameters at *b*, and in transverse section at *c*.—Pharm. Journ., Jan. 3, 1903, 7.

*Sambucus Racemosa—Characters of the Fixed Oil.*—H. O. Byers and P. Hopkins have examined the fixed oil of the red elderberry, *Sambucus racemosa*, var. *arborescens*, which is plentiful on the western slopes of the Cascade Mountains. The oil was obtained by pressing the fruit and extracting with ether the crude oil which rose to the surface of the juice. In general characters the purified oil closely resembled olive oil, as shown by the following figures: Sp. gr., 0.907; congealing point, — 8° C.; m. p. of fatty acids, 38° C.; saponification number, 209.3; iodine number, 81.44; Hehner number, 91.75; Reichert-Meissl number, 1.54; free acid, 6.65 per cent.; palmitin, 22 per cent.; olein and linolein, 73.6 per cent.; caprin, caproin and caprylin, 3.0 per cent.; unsaponifiable matter, 0.66 per cent.—Pharm. Journ., Oct. 4, 1902, 336; from Journ. Am. Chem. Soc., *24*, 771.

*Viburnum Prunifolium—Histological Character of the Bark.*—W. Mitlacher has determined the microscopic structure of black haw bark to be as follows: In the cortex and bast-ring, groups of stone cells are to be found, which, from their axial elongation, bear a considerable resemblance to bast fibres; the quantity of such cells varies very considerably. Primary bast fibres (pericyclic fibres) are to be found in young barks, but these are eventually thrown off by the formation of secondary phellogen, and older barks are devoid of bast fibres. The cells of the cortex and of the medullary rays contain a granular substance which is stained by alkanna and is converted by caustic potash into an emulsion containing innumerable yellow droplets of oil. The powder is characterized by the numerous stone cells of varying shape, the rosette crystals of calcium oxalate and sieve tubes with long oblique sieve plates. In caustic potash numerous oily globules make their appearance. A sample of the bark yielded to petroleum spirit 11.156 per cent. of a viscous, dark-brown substance, which was completely insoluble in alcohol.—Pharm. Post, *35*, 773.

### UMBELLIFERÆ.

*Asafetida—Deficiency in Resin.*—C. H. La Wall, after reviewing the experience of others, both in this country and abroad, that it is difficult to find asafetida in the market yielding as much as 60 per cent. of alcohol-soluble matter, this being the U. S. Pharmacopœia requirement, gives the results of his own experience. During the past spring he had occasion to examine samples of asafetida which were taken from forty-six cases, which were held up by the custom authorities as being below the treasury requirements. The custom authorities referred to are those of the port of Philadelphia. The cases were carefully sampled and the samples thoroughly mixed. This material was of prime appearance and would pass anywhere for first-class asafetida; but upon estimating the alcohol-soluble material it was found to fall below 33 per cent. In consequence of this deficiency

in quality, the entire lot was prevented from coming into this port and was sent back to Europe to be sold there. Other samples were obtained, and a selection made from them, when it was found that the best-appearing sample submitted showed a percentage of only 30 per cent. alcohol-soluble material. The only specimen which has come under the author's notice recently which has exceeded 50 per cent. soluble material, was a small lot which had been held by the seller for at least a dozen years, which was badly discolored from having been through a fire, and which had nothing to do at all with the present market supply.—Proc. Pa. Pharm. Assoc., 1902, 92.

ARALIACEÆ.

*Ginseng—Cultivation.*—During the past few years the subject of ginseng cultivation has been so frequently discussed that a review by so competent an authority as John R. Jackson, of the Kew Botanical Gardens, cannot be passed without some notice here. The first consideration is said to be that of soil, which should be light, friable loam, rich in vegetable mould, and should possess good drainage. Clay soil or heavy clay loam is not suitable. Ginseng seed will not germinate until it has been kept eighteen months after maturing, and during this period it must not be allowed to become dry. The soil should be well prepared by digging and enriched with farmyard manure. October is the month for planting either seeds or roots, which should be set 8 inches apart each way. A good, deep hole should be made for the insertion of the roots, which vary from 2 inches or 3 inches to 10 inches long, and care must be taken not to break or bend them, so as to ensure good, straight roots at harvest time. The top of the root should be 2 inches below the surface of the ground. The seeds should be planted 1 inch apart in shallow drills, thinning them out to the proper distances when sufficiently grown. In November the entire bed should be mulched with a good covering of leaves, which may be removed in the following April. About three times during the growing season the surface soil should be broken up and the weeds removed. In America artificial shade is always required, a lattice-work structure being erected over the beds. The care of ginseng after it is planted and shaded is exceedingly light and simple. The roots should be taken up in the following October, care being required in the digging to avoid breaking them. All roots of less than half an inch diameter should be set apart for future planting, the selected roots being dried by spreading them on trays or tables in the sun, which will require six or eight weeks; but they may be dried quicker and better by artificial heat, in a temperature of from 100° to 120° F. By this method the roots may be dried in nineteen days, and in drying they lose two-thirds of their weight. These instructions seem to have been followed at Kew, from whence it is reported that ginseng has been tried again and again, and that it will not grow in England. The conditions for its successful culture are said to be as yet unknown,

but may probably be found in the soil. Ginseng and its near allies have a wide geographical range. It is found wild in the woods of Chinese Tartary, in the woods of Canada, and also in some of those of the United States. In so wide a range one would think there would also be as wide a diversity of soils. The details and hints here brought forward may perhaps be sufficient to induce some of the English growers of medicinal plants to make experiments on the different soils which obtain in the several counties where such gardens are situated. Mr. Jackson's paper is

FIG. 45.

Ginseng Leaves, Fruit and Roots.

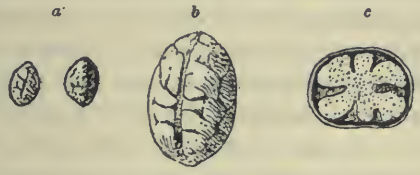
illustrated by the accompanying cut (Fig. 45), showing ginseng leaves, fruit and roots all reduced in size.—Pharm. Journ., June 6, 1903, 785.

*Ginseng—Excessive Crops in Korea.*—The following information from a report of the United States Minister at Seoul (1902) may be of particular interest to prospective "ginseng growers." It is stated that the entire Korean ginseng crop for 1901, amounting to 52,000 catties, was bought by a Japanese firm, and the purchasers deliberately burned 10,000 catties, as the supply was greater than the demand. It is said that considerable portions of last year's crop still remain unsold in China, and that this year's yield in Korea is sufficient for nearly three years' consumption. As the Chinese are practically the only consumers the market is limited. Ginseng is regularly cultivated in various parts of Korea, but only that raised upon the imperial farm at Songdo is highly valued as a medicine. For the past few years the crop has been growing larger; 15,000 catties (19,650 pounds) have been considered the normal quantity, but by gathering it at a five years' period instead of seven, and by increasing the number of beds,

the quantity has been increased so that the supply now exceeds the demand.—Pharm. Era, Sept. 11, 1902, 273.

*Ivy Fruits and Seeds—Concise Description.*—Dr. E. M. Holmes describes the fruits of *Hedera helix*, L., as blackish-purple berries, almost the size of a pea, and considers it probable that the fine pinkish tint possessed by seeds that had passed through the intestines of fowls poisoned by them is due to the purple coloring-matter of the fruits having been changed to pink by the action of some acids. The seeds (pyrenes) are oval, flattened on one side, with a central furrow, and convex on the other, 12 Mm. long by

FIG. 46.




Ivy Seeds.

9 Mm. broad, and 6 Mm. deep. The surface is faintly tuberculated and marked with faint reticulated lines due to the infolding of the inner seed-coat. The ruminated character of the seed caused by this infolding is readily seen in transverse section, and distinguishes it from that of the elder seed (see under "Caprifoliaceæ"). Fig. 46, at *a*, shows ivy seeds in natural size, at *b* magnified 4 diam., and at *c* in transverse section.—Pharm. Journ., Jan. 3, 1903, 6.

RANUNCULACEÆ.

*Indian Aconites—Poisonous and Non-Poisonous Varieties.*—Among the researches that are in progress in the "Imperial Institute," those on the varieties of *Aconitum* found in India possess great pharmacognostic interest. Dr. Watt, in 1900, made a collection in all parts of India of the indigenous species of aconite as a preliminary measure for the determination of the origin of the commercial sorts. In this way he found that there are at least eight kinds, and these he has provisionally named. Herbarium specimens have also been submitted to other botanists in England, and a thorough investigation of the material is now being made. A collection of representative samples of all the aconite roots sold by wholesale houses throughout India was also made, and by comparison with the roots of the herbarium specimens, these were identified and classified. The material obtained in this way has been sent to the "Imperial Institute" for investigation and considerable progress has now been made in the isolation and identification of the alkaloids contained in the new species, illustrations of the following species and varieties, from photographs of herbarium specimens prepared by Dr. Watt, accompanying the paper from which this abstract is made, namely:

*Aconitum Napellus*, Lin., var. *Hians*. Vernacular: Mohri. Locality: Hazara, Pungaub.

*Aconitum ferox*, Wall., var. *atrox* (Wall. sp.). Vernacular: Mohra. Locality: Jahri Kandu, Bushar.

*Aconitum ferox*, Wall., var. *laciniata*, P. B. Vernacular: Bikhoma. Locality: Singalila Range, Darjeeling.

*Aconitum ferox*, Wall., var. *spicata*, P. B. Vernacular: Bikhoma. Locality: Singalila Range, Darjeeling.

*Aconitum palmatum*, D. Don. Vernacular: Seto Bikhoma. Locality: Tangloo Range, Darjeeling.

One of the most interesting of these is *Aconitum Napellus*, var. *Hians*, which rarely occurs in commerce and contains a new, crystalline, poisonous alkaloid which will shortly be described. A second variety, *Aconitum Napellus*, var. *multifida*, is non-poisonous, and is used by the hill tribes of the Himalayas as a tonic. Several varieties of *Aconitum ferox* are being examined. Of these two, var. *atrox* and var. *polyschiza*, have been proved to contain pseudaconitine—the var. *atrox* being the ordinary Nepaul aconite, which occurs occasionally in European commerce, while the var. *polyschiza* is unknown in trade. *Aconitum ferox*, var. *spicata* and var. *laciniata*, are at present under investigation, while a new, non-poisonous alkaloid, which has been named "palm-aconitine," has been obtained from *Aconitum palmatum*. The roots of the latter are often confused both with those of *Aconitum heterophyllum* and *Aconitum ferox*, var. *laciniata*, although the former is a harmless tonic and the latter is a virulent poison. The physiological action of the various alkaloids obtained is now the subject of investigation.—Chem. and Drug., July 26, 1902, 158, 159.

*Aconite—Comparison of the Chemical and Physiological Method of Assay.*—Prof. A. B. Stevens, in view of the doubt existing in regard to the value of chemical methods for the assay of aconite, has selected a method of assay, considered the best in his judgment, and compared it with the physiological method, viz.: Squibb's test (dependent on the sensation of tingling and numbness produced on the tongue.—Rep.), and the toxic dose for a frog of given weight. To apply physiological tests, a liquid preparation of the drug must be employed; the author selecting the tincture as the best representative of the active constituents, and this was also used for the chemical assay, so that the comparisons might be based upon results obtained from the same sample. The results of the different experiments made, led the author to formulate his conclusions as follows:

1. That the decomposition products of aconitine, obtained by heat, are not the same as those formed by natural decomposition, as the former neutralize acid while the latter do not.

2. That the lethal frog dose is not suited to the standardization of aconite.

3. That Squibb's test is reliable for the purpose of determining the qual-

ity of aconite or its preparations, but that it is not as valuable for standardization as the chemical assay.

4. That the chemical method is not reliable for the assay of extract.

5. That the chemical method of assay is reliable when applied to the assay of aconite root, or its preparations, provided they have not been subjected to heat. The chemical method which has given the best results, is carried out as follows:

Place 10 Gm. of aconite in a flask; add 75 Cc. of a mixture of alcohol, 7 volumes, and water, 3 volumes; then agitate for four hours. Place a plug of cotton in the bottom of a small percolator, 25 Mm. in diameter, and add the mixture. When the liquid has all passed through, percolate with the same menstruum until 150 Cc. of percolate are obtained. Pour the percolate on an ordinary dinner plate and mix with five Gm. of powdered pumice-stone, then evaporate to dryness at a temperature not exceeding 60° C. Add 5 Cc. of $\frac{N}{10}$ sulphuric acid and 10 Cc. of water. When the extract is dissolved filter into a separator. Wash the plate and filter with about 40 Cc. of water. Add 25 Cc. of ether and 2 Cc. of ammonia water and agitate for five minutes. Draw off the lower layer into a flask and filter the ether into a beaker. Return the contents of the flask to the separator, add 15 Cc. of ether and agitate three minutes. Draw off the lower layer into the flask and filter the ether into the beaker. Repeat with two other portions of 10 Cc. each of ether. Evaporate the ether to dryness and dissolve the residue in 3 Cc. of $\frac{N}{10}$ acid. Titrate the excess of acid with $\frac{N}{50}$ alkali, using haematoxylin as indicator. Multiply the number of Cc. of acid consumed by the alkaloid, by 0.645 to obtain the percentage of alkaloid in the aconite. The end reaction is usually green, sometimes violet; but in either case the end reaction is sharp. Slight modifications, necessary for the assay of the preparations, are also given. These may be consulted in the author's paper in Pharm. Arch., 1903, *6*, No. 4, 49–55.

*Hellebores—Comparative Study of the Rhizomes of Different Species.*—Prof. A. Tschirch, assisted by E. Neuber, has made a comparative study of the rhizomes and roots of the following species of *Helleborus: H. viridis*, *H. niger*, *H. fœtidus*, *H. caucasicus* and *H. purpurascens*. A number of drugs that are sometimes mistaken or substituted for hellebore are also described, among them *Actæa spicata*, in order to establish characters whereby these drugs might be distinguished from each other, with the following results: The rhizome of *H. niger* exhibits a small pith and comparatively large, acutely wedge-shaped, radially elongated wood-bundles; the root is often flattened, and possesses a stellate wood with blunt points. The rhizome of *H. viridis* has a large pith and tangentially extended, bluntly wedge-shaped or almost square wood-bundles; older roots exhibit a wood with from five to seven pointed rays. In both rhizome and root of *H. fœtidus* the wood is more strongly developed and radiate in appearance;

it contains abundance of wood fibres, and encloses but little or no pith. The rhizome of *Actæa spicata* is flattened and bears cushion-like protuberances, due to the remains of the aërial stems. The wood-bundles are thickened at either extremity, and surrounded by wood fibres, so that in transverse section the wood ring has a scalariform appearance; the root exhibits a regular three- to five-rayed wood, the rays being broader towards the outside.—Schweiz. Wchsch. f. Pharm., 1902, 410.

BERBERIDEÆ.

*Podophyllum Root—Percentage of Resin.*—Seven samples of the root of *Podophyllum peltatum* examined during the last four or five years in the laboratory of Southall Brothers and Barclay, yielded from 1.60 to 3.86 per cent. of resin—being an average of 2.19. Mr. Barclay, of the firm mentioned, states that these figures are confirmed by the manufacture of podophyllin on a large scale, and that therefore it is difficult to understand how a standard of 5 per cent. resin for podophyllum root, such as has lately been recommended, can have been arrived at, unless the Indian root (*P. emodi*) be included. A sample of this latter, examined during last year, yielded us 6.69 per cent. of total resin.—Pharm. Journ., Feb. 7, 1903, 164.

MENISPERMACEÆ.

*Colombo Root—Alkaloidal Constituents.*—Gadamer finds that colombo root contains at least two yellow alkaloids, which resemble but are not identical with berberine, and that the latter is not a constituent of colombo. These yellow alkaloids are readily reduced to colorless hydro compounds, which are soluble in ether and are tertiary bases, whereas the original alkaloids are quarternary bases.—Apoth.-Ztg., 1902, 690.

RUTACEÆ.

*Cay-Cay—The Indo-Chinese Wax Tree.*—One of the most beautiful trees in the vast forests of Indo-China is known by the natives as the cay-cay, whose fruit and seeds yield an abundance of wax. According to Broumische, this tree is placed in the family of the *Rutaceæ*, under the name

*Ivingia Harmandiana.*—It is widely distributed in the forests of Cochin-China, and is also found throughout Cambodia and Anam. It grows to a large size, frequently attaining a height of forty meters (about 130 feet), with a diameter of trunk of 1.20 meters (four feet). The latter is straight and clean and terminates in a bushy head of deep green foliage. The wood is exceedingly hard, of a very fine and compact grain, difficult to work, but susceptible of an exquisite polish. The bark is bitter and rich in tannic principles. It flowers at the end of the dry season, the fruit ripening in July. The latter consists of drupes of the size of an ordinary plum, with fibrous mesocarp and ligneous endocarp, and incloses an oily

kernel. When the fruit ripens, the Anamese repair to the forests and pick them up as they fall from the trees and pile them up on the ground. When the fibrous mesocarp is destroyed, by process of decay, the nut is carried to the villages and then placed in the sun to dry. The kernels, which shrivel somewhat under this process, are extracted and are bruised in wood or stone mortars and made into a paste. This latter, heated and submitted to powerful pressure, gives up its fatty principle, which runs out in liquid form, but solidifies upon cooling. In its solid form, the product is known in Cochin-China as cay-cay wax. By this crude treatment the amount of wax yielded is equal to 20 per cent. of the weight of the kernels treated, but when the latter are extracted by means of carbon disulphide, the yield is 52 per cent. (Vignoli). Without doubt, when the fruit is gathered, as soon as ripe (not waiting for windfalls), and the kernels immediately submitted to pressure in properly-constructed oil presses, the yield is much larger than by the native method; beside which the residue forms an oily cake of great value as a fertilizer and as food for domestic animals. It is eagerly eaten by quadrupeds and fowls.—National Drug., Nov., 1902, 332.

*Guaiacum—Saponin an Active Constituent.*—Schaer attributes the antisyphilitic, diaphoretic and antiarthritic properties of guaiac to a content of saponin, which he suggests should be isolated and compared with other known forms of saponin as to its chemical and therapeutic properties.—Amer. Journ. Pharm., Sept. 1902, 443; from Arch. f. Exp. Path. u. Pharmakol, 1902.

*Jaborandi—Distinctive Histological Characters.*—In an account of the various commercial jaborandis, including a few species of *Pilocarpus*, the leaves of which are not found in commerce, A. Duval states that the leaflets of *Pilocarpus Jaborandi* are characterized and distinguished from those of other species by possessing a complete ring of wood in the midrib, a single layer of palisade cells, glandular hairs that are not sunk in deep depressions of the epidermis, and long simple hairs.—Pharm. Journ., April 18, 1903, 538; from Bull. des Sciences Pharm., *5*, 41.

### MALVACEÆ.

*Ochra Seeds—A Useful Substitute for Coffee.*—Rattier directs attention to the use of the seeds of *Abelmoschus* (*Hibiscus*) *esculentus*, N. O., as a substitute for coffee, claiming that the roasted seeds yield a very agreeable preparation, decidedly superior to many varieties of coffee, and sometimes even comparable to "Mocha." To obtain this result, however, only well-selected and ripe seeds must be employed, which have been roasted with great care, this process consisting in placing them in a coffee-roaster and continuing to heat them as long as a crackling sound is heard. When this ceases they should be spread out so as to cool as quickly as possible, then ground to a fine powder, sifted, and mixed either with milk or sweetened water.—Pharm. Journ., Feb. 21, 1903, 233; from "La Nature."

LINACEÆ.

*Linum—Destructive Action of Moulds and Bacteria on the Fibre.*—M. L. Hauman, in view of the fact that the aerobic retting of flax is attributed to the action of moulds and bacteria, made an examination of flax plants. This led to the discovery of several of these, which by means of pure cultures on sterilized flax, were shown to be capable of breaking up the flax fibres. The most abundant forms were the bacteria *Bacillus coli* and *Bacillus mesentericus* and the mould *Cladosporium herbariorum*, but the moulds *Penicillium glaucum* and *Mucor mucedo* worked the most destructively, for besides causing the retting they attacked the cellulose of the fibres and destroyed their texture. The association of retting with the organisms was demonstrated by exposing two handfuls of flax side by side to the action of the atmosphere. The one part was treated antiseptically every few days, while the other was not touched, with the result that after a month the untouched flax was retted while the other portion was not destroyed at all. The action of the organisms consists mainly in destroying the pectic compounds of the middle lamellæ.—Pharm. Journ., Dec. 6, 1902, 601 ; from Comptes rend., *134*, 1,163.

*Flax—Nature of the "Flax Wilt."*—In Ireland, Belgium, Germany and other flax-giving countries of Europe, a disease known as "flax wilt" has long been credited with confidence to impoverished soil due to the long-continued cultivation of the same crop upon it. According to M. C. Cooke, however, recent experiments made at the North Dakota experimental station prove that this is not due to exhaustion of the soil, but to the attacks of a new fungus, *Fusarium lini*, which preys on the *débris* of the previous year's crop and attacks and kills the seedlings.—Pharm. Journ., Dec. 27, 1902, 695 ; from Gard. Chron., *32*, 362.

TERNSTROMIACEÆ.

*Tea—Monographic Description.*—Wm. B. Marshall has contributed a concise monographic description of tea, its botany, the plant, its geographical distribution, history, cultivation, preparation for market, chemistry, effects, social status, substitutes, adulterants and commerce. The subject is too voluminous for profitable abstraction, and must be consulted in the original in Amer. Journ. Pharm., Febr., 1902, 79–94.

*Tea—Cause of the "Gray Blight" in Ceylon.*—Mr. Carruthers, the government mycologist in Ceylon, has now found the fruiting stage of the fungus (*Pestalozzia guspini*) which causes the gray blight, and is the chief enemy of the tea-planter on that island. It appears that when the fungus attains a vigorous state of development the mycelium grows back down the leaf-stalk and into the young shoot on which the leaf is produced. It thus enjoys a more prolonged existence and is enabled to form an ascus-bearing fruit. The gray blight has not so far been found on the leaves of any wild plant, though jungle and scrub often border the plantations.—

Pharm. Journ., July 12, 1902, 21 ; from Circular of Royal Botanic Gardens, Ceylon.

## STERCULIACEÆ.

*Prepared Cacao—Constituents of Various samples.*—E. G. Clayton communicates in detail the results of analyses of a number of samples of prepared cacao (cacao deprived of fat and otherwise treated—so-called "cocoa essences"), which may prove useful for reference.

| | Sample. | | | | |
|---|---|---|---|---|---|
| | 1. | 2. | 3. | 4. | 5. |
| Water | 4.62 | 3.22 | 3.59 | 5.33 | 4.28 |
| Fat | 33.11 | 32.69 | 30.50 | 22.30 | 27.46 |
| Therobromine | 1.82 | 0.93 | 0.88 | 0.83 | 2.69 |
| Caffeine | 0.08 | 0.02 | 0.42 | 0.66 | 0.16 |
| Starch | 5.63 | 6.56 | — | 5.06 | — |
| Proteids | 15.56 | 14.31 | 14.19 | 19.50 | 12.12 |
| Maltose | — | — | — | 1.64 | — |
| Cellulose | 5.65 | 9.29 | 6.97 | 5.59 | 4.21 |
| Cocoa-red,dextrin,tannin,etc | 27.82 | 25.15 | 37.35 | 32.47 | 42.77 |
| Ash | 5.71 | 7.83 | 6.10 | 6.62 | 6.31 |
| | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Soluble ash | 3.20 | 7.44 | 5.67 | 4.67 | 3.13 |
| Insoluble ash | 2.51 | 0.62 | 0.43 | 1.81 | 3.18 |
| Alkalinity (as $K_2O$) of soluble ash | 1.16 | 2.94 | 2.21 | 1.48 | 0.86 |
| Total phosphoric acid ($P_2O_5$) | 1.91 | 1.72 | 1.93 | 1.92 | 1.29 |
| Soluble phosphoric acid | — | — | — | — | 1.15 |
| Insoluble phosphoric acid | — | — | — | — | 0.14 |
| Silica | — | 0.36 | — | 0.69 | — |
| Iron oxide | — | trace | — | 0.32 | — |
| Proteid nitrogen | 2.49 | 2.29 | 2.27 | 3.12 | 1.94 |
| Cold water extract (total) | 17.90 | 17.20 | 14.56 | 18.25 | — |
| Cold water extract (organic) | 15.10 | 12.30 | 10.48 | 13.29 | — |
| Alkalinity of cold water extract | 2.76 | 3.39 | 2.72 | 2.75 | — |
| Ash of cold water extract | 2.80 | 4.90 | 4.08 | 4.96 | — |

—Chem. News, Aug. 1, 1902, 51.

*Cacao Shells—Detection in Prepared Cocoa.*—Dekker confirms the observation made (in 1899) by Skertchly that cacao shell contains from 8.18 to 9.63 per cent. of pentosanes, whereas cacao-nibs contain only from 2.17 to 2.41 per cent. Hence an admixture of shells with powdered cocoa can be detected and estimated by determining the amount of pentosanes. It must, however, be clear that neither the detection nor the determination can be accepted unless other substances containing pentosanes are proved to be absent.—Schweizer. Wochenschrift, *40*, 463.

*Cola Seeds—Varieties and their Botanical Source.*—Considerable attention has lately been paid to the botanical sources of the several varieties of cola seeds that are known. Schumann has pointed out that the cola seeds, with two large cotyledons, such as are met with in commerce and prized as the best, are not derived from *Cola acuminata*, but from a distinct species which he named *C. vera*. Warburg has now examined specimens of cola trees from Ashanti and from Kpandu. In the former case he finds slight differences in the floral envelopes and in the andræcium, which indicates that it is possibly a new species or variety of *C. vera*. As the andræcium is lobed, he proposes the name *C. sublobata* for it. The Kpandu cola tree possesses a stellate andræcium borne upon a slender stalk, and for this plant the name *C. astrophora* is put forward. Both of these trees yield seeds with two large cotyledons.—Apoth. Ztg., 1903, 35; from Tropenpflanzer.

*Kola Nut—Alkaloidal Assay.*—According to J. Warin it is essential, in the determination of the total alkaloid of kola nut and its preparation, to allow the alkaline earth employed (lime or magnesia) sufficient time in the moist state to entirely liberate the organic bases, before extracting with chloroform. He therefore thus modifies the process of analysis as applied to the

*Fluid Extract of Kola:* 15 Gm. of the liquid are heated on the water bath until all the alcohol is driven off. The residue is then triturated with calcined magnesia, 10 Gm., and water, 2 Gm., and allowed to stand for some time. The moist mass is then transferred to a flask of the capacity of about 200 Cc. with a wide mouth. 150 Gm. of chloroform are then added, the flask contents being weighed. An upright tube condenser is then inserted, and the chloroform boiled on the water bath for forty-five minutes; the mixture is then cooled and any loss of weight made up by the addition of more chloroform. 100 Gm. of liquid is then filtered off (= 10 Gm. of original fluid extract) the solvent distilled or evaporated off, and the residue, dried to constant weight, weighed as total alkaloid.

*Powdered Kola:* 15 Gm. is weighed off, triturated with calcined magnesia, 10 Gm., and water, 15 Gm., then treated as described for the fluid extract. The author prefers magnesia to lime, as recommended by Dieterich, since although the yield of total alkaloid obtained with it is about 0.1 per cent. lower, it does not, in practice, give rise to bumping when boiling with chloroform, and is, moreover, always at hand in the pharmacy in a state of purity.—Pharm. Journ., July 5, 1902, 19; from Journ. Pharm. Chim., [6], *15*, 373.

GUTTIFERÆ.

*Quinia Jamaicensis—Source of the so-called "Velvet Seeds."*—Attention is directed in "Agricult. News" (*1*, 265) to *Quinia jamaicensis*, a shrub found on the mountains of St. Ann's, Jamaica, which is the source of the

beautiful, chestnut-colored, silky-coated seeds known as "velvet seeds." These seeds are quite rare, but deserve cultivation for ornamental purposes.

## AURANTIACEÆ.

*Limes—Superior Acid Content of the West Indian Fruit.*—Dr. E. M. Holmes calls attention to the superiority of West Indian limes in acid content. Some analyses made by the government chemists at Antigua on varieties of the lime, to test the acidity of the juice of the ripe fruits, have proved that the juice of the ordinary lime contains 36.15 grains of citric acid per ounce, and that of the spineless variety 37.73 grains, as against 30.32 from the Sicily or Villa Franca lemon, showing that the spineless variety is the best for citric acid manufacture or for lime juice. The fruits were grown at the Botanic Station, Dominica.—Pharm. Journ., May 23, 1903, 705.

*Orange-Peel—Elementary Composition.*—In connection with researches on some cellulose constituents of orange-peel, H. Stanley gives the results of elementary analyses of the inner and outer peel—the whole peel being divided into two layers, the outer of the typical orange color, the inner one white and of a soft texture, both being dried at 100°–105° C. The results are given as follows:

*Inner Layer.*—0.1649 Gm. gave 0.2945 Gm. $CO_2$, 0.0860 Gm. $H_2O$, and left 0.0047 Gm. white ash. Hence (ash free), C = 50.44 per cent., H = 5.96 per cent., O = 43.60 per cent. The peel contains no nitrogen. The ash preserves to some extent the skeleton of the original fragments, and amounts to 2.95 per cent. The above composition corresponds closely to the formula $C_{34}H_{48}O_{22}$, which, curiously enough, is given to oak wood by W. A. Miller on the results of a similar analysis.

*Outer Layer.*—The results may here be vitiated by the presence of traces of essential oils not removed by drying. It was expected that this layer would have had the higher carbon percentage, which, however, is not apparently the case. 0.1648 Gm. gave 0.2703 Gm. $CO_2$, 0.0946 Gm. $H_2O$, and left 0.0046 Gm. white ash. Hence (ash free), C = 45.78 per cent., H = 6.37 per cent., O = 47.85 per cent., ash = 2.84 per cent. The proportion of carbon is in both cases higher than that required by the formula $C_6H_{10}O_5$ (C = 44.2, H = 6.3, O = 49.5).—Chem. News, May 8, 1903, 220.

*Citrus Species—Variation of their Roots.*—J. W. Mills has ascertained at one of the experimental stations of the University of California, that the roots of the different species of the genus *Citrus* vary considerably. Thus the sweet orange is a surface feeder, having its entire root-system above a depth of eighteen inches, and rising to within eight inches of the surface, whilst that of the sour orange penetrates to a depth of nine feet or more with sometimes numerous laterals near the surface, and sometimes fewer,

more sharply-descending laterals. The pomelo produces more fibrous roots than either of the others, and its lateral roots descend to a greater depth than those of other stocks, and it is more resistant to a form of gum disease that attacks the roots of citrus trees. As a stock for grafting it is therefore preferred in California.—Pharm. Journ., Dec. 6, 1902, 601 ; from Agric. News, *1*, 132.

VITACEÆ.

*Grape Vines—Investigation Concerning the "Black Rot."*—The disease of the vine known as "black rot" is caused by the fungus *Guignardia Bidwillii*. During the winter the mycelium does not persist in the stock, but sclerotia or stromata are formed on the grapes. On these, perithecis are formed in the spring, the spores of which attack the vine. The mycelium formed from the spores soon produces pycnidia, conidia-bearing organs. The conidia can also germinate on the host plant. Prunet now gives an account of his observations on the extent to which external conditions modify the spread of the disease. A continued spell of rain provides the most favorable conditions for the invasion of the host plant by the fungus; fogs or short, sharp showers are not nearly so dangerous. Also, as might be expected, the warmer the weather the sooner will the conditions for development be attained, so that a continuous day's rain in July or August will do as much damage as three or four days' continuous rain in April or May.—Pharm. Journ., July 26, 1902, 66 ; from Compt. rend., *134*, 1072.

HIPPOCASTANEÆ.

*Horse-Chestnut—Examination and Possibilities.*—At the meeting of German Naturalists and Physicians, held at Carlsbad, Sept. 21–27, 1902, Dr. E. Leaves called attention to the food value of horse-chestnuts and to the possibility of making this food available by removing the saponin, bitter principle and other objectionable components by means of alcohol. This

*Alcoholic Extract of Horse-Chestnut*, furthermore, is recommended as being possibly useful in medicine.—Amer. Journ. Pharm., Dec. 1902, 600.

ERYTHROXYLACEÆ.

*Erythroxylon Coca—Cultivation in the Cameroons.*—Among other plants of medicinal value, the coca plant,

*Erythroxylon Coca* is being experimentally cultivated in the Victoria botanical garden of the Cameroons. A firm of alkaloid makers in Germany, to whom some of the leaves were sent, found them to contain 0.28 per cent. of total alkaloid. This low yield may be attributable either to improper drying of the leaves or deterioration during the long voyage. It is suggested that it would be advisable to extract the crude alkaloid for export, unless the leaves can be carefully packed in air-tight boxes with-

out unduly increasing their cost.—Pharm. Journ., Nov. 8, 1902, 463; from Imp. Inst. Journ., *94*, 268.

*Coca—Constituents in Leaves from Java.*—O. Hesse has extracted four definite compounds, not of the nature of alkaloids, from the leaves of coca obtained from Java. These bodies are (1) Cocacitrin, $C_{23}H_{32}O_{17}$, a yellow crystalline compound with three molecules of water, melting at 186° C. This appears to be a glucoside, yielding a sugar, cocaose, which may be identical with dextrotalose, since its osazone melts at 180° C. (2) Cocacetin, $C_{16}H_{12}O_7$, forming yellow needles with three molecules of water of crystallization. This melts at 260°–265° C. (3) Cocaflavin, $C_{34}H_{38}O_{19}$, which forms yellow crystals with four molecules of water. It yields dextrose and galactose on hydrolysis with dilute sulphuric acid, and is, therefore, probably a glucoside. (4) Cocaflavetin, containing two methoxy groups, forms greenish-yellow needles with three molecules of water and melts at 230° C.—Pharm. Journ., April 25, 1903, 585; from Journ. für Prakt. Chem., *66*, 401.

*Coca Leaves—Variation in Alkaloidal Content.*—John Barclay reports that, as was the case last year, there is a very considerable variation in the alkaloidal percentage of this drug, the amount ranging from 0.13 in a sample of Peruvian leaves to 0.84 in a parcel of the Bolivian variety. He considers it to be of the highest importance that the fluid extract of this drug should be required to contain a definite percentage of alkaloid.—Pharm. Journ., Jan. 24, 1903, 97.

MELIACEÆ.

*Nim Leaves—Value as an Insecticide.*—The leaves of the "neem" or "nim" tree, *Melia azadirachtas*, have long been used in India as an insecticide. It is stated in "Pharm. Journ." (May 30, 1903, 755) that when distilled with steam, the leaves evolve an odor of an allyl compound without giving a distinct oily distillate. The fresh leaves crushed with water also give evidence of a mustard-like oil. Experiment has shown that the fresh leaves do not have the same effect as the dried and powdered leaves. Two wide-mouthed bottles were taken; into one fresh leaves, and into the other powdered leaves were introduced. In each a healthy blood-sucker was placed. The insect avoided the powdered leaf, and used every effort to keep away from it, and died after sixteen hours' confinement, probably from its exhaustion in its attempts to get free. The insect imprisoned with the fresh leaves remained active for thirty hours and seemed to be none the worse at the end of that time. The smoke from the burning leaves is distinctly toxic.

SAPINDACEÆ.

*Soap Nuts—A Valuable Detergent.*—Attention is drawn in "Revue des Cultures Coloniales" (*10*, 282) to "soap nuts," the fruits of

*Sapindus mukorosis* and allied species, which have recently been occasionally imported into France. It appears that the variety *carinatus* of this species is recognized in Algeria as being useful not only for cleaning silks and other fabrics, but giving them a peculiar brilliancy which other saponaceous material, such as quillaia, do not appear to give. A single tree may yield as much as 100 kilos of fruit. The dried pulp of the fruit, separated from the hard, globular seeds, is said to contain from 62 to 67 per cent. of saponin.—Pharm. Journ., Aug. 2, 1902, 85.

FUMARIACEÆ.

*Dicentra Cucullaria—Alkaloidal Constituents.*—The genus *Dicentra*, of which there are about fourteen species, is represented by three species in the northern United States, viz.: *D. cucullaria*, *D. canadensis* and *D. eximia*, only one of which, *D. canadensis*, appears to have been examined and found alkaloid-bearing. In order to determine whether *D. cucullaria* —which according to Dragendorff has been used medicinally as a diuretic and blood purifier—also contains alkaloids, and particularly to see whether it contained protopine, the characteristic alkaloid of the Fumariaceæ and Papaveraceæ, R. Fischer and O. A. Svell have subjected the whole plant, collected near Madison, Wisconsin, to investigation, which gave results from which they concluded that *Dicentra cucullaria* contains at least three alkaloids, one of which is protopine. The identity of the other two with known alkaloids remains subject for further examination.—Pharm. Arch., *5*, No. 7, 123, 124.

PAPAVERACEÆ.

*Opium—Assay of the Moist Drug.*—In order to avoid error in the assay of opium, due to the water in the moist drug, Prof. A. B. Stevens carries out his method (which see under "Tinctures of Opium") as follows: Estimate the moisture in 10 Gm. of the natural moist opium, and powder the dried residue. Thoroughly mix in a mortar 4 Gm. of the dried opium with 2 Gm. of the dry freshly-slaked lime, add 10 Cc. of water and triturate continually for fifteen minutes until a perfectly smooth mixture results. Finally add 19 Cc. of water, triturating frequently for half an hour and proceed as in the estimation of powdered opium. The per cent. of moisture obtained multiply by one minus the per cent. of moisture, and add 1.125 per cent. for loss of moisture during estimation. This gives the per cent. of moisture in the crude opium. It is hard to reduce the dried opium to as fine a powder as the powdered opium of the market. Therefore, great care must be exercised in triturating the opium and lime in order to produce a perfectly smooth mixture. This applies also to granulated opium.—Pharm. Rev., Oct., 1903, 463.

*Opium—Stevens' Method of Assay.*—Referring to Stevens' recent modification of the assay process for opium proposed by him (see Proceedings, 1902, 863), C. C. Rittenhouse and L. E. Sayre communicate the results

of experiments undertaken for the purpose of determining whether the process, as is claimed, is materially shortened by the modification, and whether it is otherwise available. They find the process quite satisfactory, and see no reason why, even in the hands of the unskilled, it may not yield quite satisfactory results. In this process 15 Cc. of the tincture are evaporated on a water-bath to a small volume. This is transferred to a mortar, rinsing the dish with water. One Gm. of calcium oxide is now added and the whole rubbed to a uniform mixture. It is then transferred to a graduated cylinder, rinsing the mortar with a sufficient quantity of water to make, in all, 30 Cc. The liquid is filtered and 20 Cc. of the filtrate transferred to a 60 Cc. bottle; 4 Cc. of alcohol and 10 Cc. of ether are added and the mixture shaken. Then 5 Gm. of ammonium chloride are added and the mixture further shaken frequently during half an hour; and set aside for twelve hours for the morphine to crystallize out. The authors, however, mention that a difficulty is experienced in measuring the mixture of lime and aqueous extract accurately in a graduated cylinder because of the bubbles held in the upper layer of the suspended lime mixture. In order to test the accuracy of a method of direct titration of the alkaloid in excess of standard sulphuric acid, several control experiments were made, using pure morphine. A definite amount was dissolved in excess of sulphuric acid and excess of acid titrated with alkali. Excellent results were obtained only by the use of hematoxylin as the indicator.—Drug. Circ., Aug., 1902, 161.

*Smyrna Opium—Systematic Adulteration.*—It is not generally known that there are two distinct varieties of opium—the soft or manufacturer's opium, used largely for the production of opium, which is usually sold by units of assay, and that known as Smyrna or druggist's opium, which, if it meets the particular pharmaceutical requirement for morphine, has other points of favor beside the total alkaloidal content. In calling attention to this, Gehe & Co., in their "Handelsberichte," 1902, state that it is this latter grade of opium that is being systematically cheapened by the admixture of either cheaper grades of opium, or where this will not reduce the morphine strength, the opium is cheapened by the addition of wheat-flour or powdered poppy heads. It is then worked over into cakes and wrapped in poppy leaves, like the original. An inferior grade of gum arabic or gum tragacanth has also been recently observed by von Vogel as an adulterant.—Amer. Journ. Pharm., Sept., 1902, 444.

*Persian Opium—Production.*—According to Siedler, the chief centers of production of Persian opium are Meshad, Whorassan, Ispahan and Hanadan, Meshad opium being the most esteemed. The seeds are sown in the spring, and the capsules incised in April, May or June. The fresh opium is often kneaded with the hand into cakes or rolled with the arm and pressed into cylindrical molds; sometimes it is made into bricks, which are usually wrapped in red paper, while the sticks are wrapped in white

paper.—Pharm. Journ., Nov. 29, 1902, 549; from Ztschr. Œster. Apoth. Ver., 1902, 112.

*Persian Opium — Possible Pharmaceutical Advantages over Smyrna Opium.*—At the meeting of German Naturalists and Physicians, held at Carlsbad, September, 1902, P. Siedler suggested that in consideration of the fact that Smyrna opium (which see) is being extensively adulterated, more attention be paid to the possible use of the better grades of Persian opium for making galenical preparations.—Amer. Journ. Pharm., Dec., 1902, 600.

BIXINEÆ.

*Annatto—Characters and Distribution of Plant Yielding It.*—John R.

FIG. 47.

Annatto Plant.

Jackson contributes an interesting paper on the annato plant, *Bixa orel-*

*lana*, illustrated by the accompanying cut (Fig. 47), showing flowers and fruits, which, giving information not generally available, is here given in brief abstract: Originally a native of South America, the plant, which is a graceful shrub or small tree, bearing handsome white or pinkish flowers, has become widely distributed by cultivation in the West and East Indies, tropical Africa and other tropical countries. In India, where the plant is very generally cultivated, the white- and pink-flowered forms appear to be equally abundant. Dr. Watt says these cannot be regarded, botanically, as varieties, but they are recognizable, and curiously enough, the natives of India regard the former as indigenous, while they readily admit that the latter is an introduction. Roxburgh even seems to have regarded the white-flowered form as indigenous, but modern botanists do not support this view. The most valuable part of the plant is the seeds, which are contained in somewhat heart-shaped fruits, which dehisce when ripe, and are then of a brown color, covered with stiff, sharp prickles, somewhat similar to those of the edible chestnut, and are a very good illustration of protection or defense assumed by some plants. The seeds, which are small, have a coating of red, waxy pulp, which forms commercial annatto by soaking the seeds in water till the coloring matter is separated, when it is strained off and evaporated to the consistency of dough or putty, when it is formed into rolls or cakes and dried, the former being known as roll, and the latter as cake annatto. Simmonds, in his "Tropical Agriculture," says "that the Indians prepare an annatto greatly superior to that which is brought to us, of a bright, shining-red color, almost equal to carmine. For this purpose, instead of steeping and fermenting the seeds in water, they rub them with the hands, previously dipped in oil, till the pulp comes off and is reduced to a clean paste, which is scraped off from the hands with a knife and laid on a clean leaf in the shade to dry. Mixed with lemon juice and gum, it makes the crimson paint with which the Indians adorn their bodies."—Pharm. Journ., April 4, 1903, 491.

CARYOPHYLLACEÆ.

*Lychnis Flos-Cuculi—Occurrence of a Saponin in the Flowering Herb.*—At the meeting of German Naturalists and Physicians, held at Carlsbad, September 21–27, 1902, Dr. Suess read a paper in which he refers to the wide distribution of saponins in vegetable drugs, and reports the method by which he has separated a saponin from the fresh flowering herb of *Lychnis flos-cuculi*, for which he proposes the name

"*Lichnidin*." It was obtained as an amorphous powder, amounting to 0.2 per cent. of the fresh herb. A report of a chemical study of this saponin is reserved for a future occasion.—Amer. Journ. Pharm., Dec., 1902, 600.

SAXIFRAGEÆ.

*Gooseberry Seeds—Concise Description.*—Dr. E. M. Holmes describes

Fig. 48.


Gooseberry Seeds.

the seeds of the gooseberry, *Ribes grossularia*, L., as being smooth (in this species), dull, faintly angular, resembling linseed in shape, and averaging 8 or 9 Mm. long, 4 Mm. broad, and 2 Mm. deep. The transverse section shows albumen, the minute embryo being at the base of the seed. Fig. 48, at *a*, shows gooseberry seeds in natural size; at *b*, magnified 4 diam.; and at *c*, in transverse section.—Pharm. Journ., Jan. 3, 1903, 6.

HAMAMELIDEÆ.

*Witch Hazel—Histological Characters of the Bark.*—An examination of the microscopic structure of witch-hazel bark by W. Mitlacher, reveals the following important histological characters: In the periderm thin-walled cork cells alternate with thick-walled, both containing an amorphous brown substance. The primary cortex is separated from the bast-ring by a continuous band of stone cells with thick, yellow walls. Noticeable in many of the cells, both of the cortex and the sclerenchymatous ring, are numerous prismatic crystals of calcium oxalate. The bast-ring is traversed by medullary rays one cell wide, which often pass through the groups of bast fibres. The latter have very thick, whitish walls with oblique pits, and are arranged in very regular tangentially elongated groups. The cells that abut on them contain monoclinic crystals of calcium oxalate. The sieve tubes are comparatively large and have very oblique sieve plates. Both the cells of the medullary rays and the bast parenchyma contain a granular, brownish substance that yields the tannin reaction.—Pharm. Post, *35*, 729.

CRASSULACEÆ.

*Sedum Tectorum—Abundance of Malic Acid in the Juice.*—R. G. Mumbray has found the expressed juice of *Sedum tectorum* to deposit crystals on standing—amounting to 0.2 Gm. from 28 Cc. of the juice—which on examination proved to be the lime salt of an organic acid, probably malic acid. The "haus-leek" or *Sempervivum tectorum*, is one of the plants suggested for the preparation of malic acid ("Die Pflanzenstoffe," Husemann, p. 537), so perhaps some of the virtues of the sedum family may be attributable to that constituent, which is apparently present in the juice in a tangible quantity.—Pharm. Journ., Sept. 20, 1902, 295.

CACTEÆ.

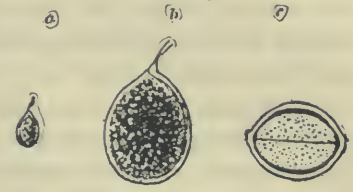
*Opuntia Vulgaris—Characters of the Mucilage.*—V. Harley has examined the mucilage of the common cactus, *Opuntia vulgaris*, and finds that it consists chiefly of arabane and galactane; it approaches tragacanth and other insoluble gums in its properties, and is not related to the pectins

either by its methods of precipitation or general characters. Its solutions are much more viscous than those of gum tragacanth, and are dextrorotatory, having the $[a]_D = + 35°$. By prolonged boiling the mucilage becomes soluble, probably undergoing hydrolysis; the optical activity of the solution is, at the same time, diminished.—Pharm. Journ., Nov. 1, 1902, 436; from Journ. Pharm. Chim. [6], *16*, 193.

CUCURBITACEÆ.

*White Bryony Fruit and Seeds—Concise Description.*—Dr. E. M. Holmes describes the fruits of the white bryony, *Bryonia dioica*, Jacq., as being red, globular, rather smaller than black bryony fruits, and not oval like the latter (which see under "Dioscoreaceæ"). The seed is ovate, compressed and mottled all over with blackish-brown, and there is a distinct marginal line on either side from base to apex. When cut transversely the substance of the seed appears to be homogeneous, but if the seed be pressed slightly in a lateral direction it is seen to separate into two halves (cotyledons), which are much softer than the horny albumen of black bryony seeds. Fig. 49 shows the seed in natural size at *a*, magnified 4 diam. at *b*, and in transverse section at *c*.—Pharm. Journ., Jan. 3, 1903, 5.

FIG. 49.



White Bryony Seed.

*Hodgsonia Kadam*, Mig.—*Chemical Examination of the Seeds.*—J. Sack has examined the seeds of *Hodgsonia kadam*, a climbing plant indigenous to Sumatra, yielding fifty to one hundred fruits per plant. The bitter seeds yield by pressure a fat of the consistence of butter, which is used locally. It is yellow in color, almost odorless and tasteless, and is present to the amount of 68.1 per cent., together with 21.5 per cent. of albumen, but no starch. They contain 2.6 per cent. of ash, 3.7 per cent. of cellulose, and 3.5 per cent. of water. The fat consists of 80 per cent. of triolein and 20 per cent. of tripalmitin.—Pharm. Journ., May 9, 1903, 641; from Pharm. Weekblad, (4), *16*, 313.

LOASEÆ.

*Eschscholtzia Californica—Alkaloidal Constituents.*—R. Fischer and M. E. Tweeden have combined the investigation into the nature of the alkaloids of *Eschsholtzia Californica*—the California poppy—which had been the subject of a previous paper by one of them. (See Proceedings, 1902, 452). From the results obtained in this and the previous investigation, it is shown that the number of alkaloids present in *Eschscholtzia Cal.* is probably seven: protopine, $\beta$ and $\gamma$ homochelidonine, "alkaloid *a*," "alkaloid *b*," sanguinarine and chelerythrine. As far as could be determined from the small quantities obtained, the alkaloids designated as *a*

and *b* differ from any other alkaloids thus far known. Further investigations will be undertaken with larger quantities of material to decide this point, as well as to throw some light on the chemical nature of these bases. Since there are a number of species of *Eschscholtzia* growing in California (Greene mentions ten), which might vary somewhat in their alkaloidal contents, special care will be taken to secure perfectly reliable and uniform material for these investigations.—Pharm. Arch., 1902, *5*, No. 7, 117–123.

COMBRETACEÆ.

"*Kinkeliba*"—*Botanical Source*.—Although the drug known as "kinkeliba" has been identified as being derived from a species of *Combretum*, the varying aspect of the plant under different conditions and at different seasons has caused travellers to mistake its identity. According to Perrot and Lefevre the plant is

*Combretum Micranthum*, and it is distinguished by containing no phloem in bands in the wood, as are found, for instance, in the allied species *C. glutinosum*. The medicinal properties of "kinkeliba" were investigated some time ago (Report de Pharm., *3*, 216) by Heckel.—Pharm. Journ., July 19, 1902; from Compt. rend., *134*, 1154.

MYRTACEÆ.

*Eucalyptus Globulus—Cultivation and Production of Oil in California*.—According to Bulletin No. 35, U. S. Department of Agriculture, considerable oil has been extracted in California from the cultivated blue gum tree (*Eucalyptus globulus*) during the past five years. The principal producer is a physician in Los Angeles, who is attempting to establish a reputation for putting up a pure, high-grade product. During the winter of 1900–1901 he extracted nine tons of oil. He does not distill out any eucalyptol, as he considers the oil in the form he puts it out superior for most purposes. The residue from the distillation of the refined oil from the crude product is put up for a salve. From the oil he manufactures a soap and cough drops. Hon. Ellwood Cooper has a young blue gum plantation on his ranch near Santa Barbara, from which he intends to manufacture both eucalyptus oil and eucalyptol. He will cut the trunk and limbs into fuel, extract oil from the twigs and leaves, and thus utilize the entire tree. The medicinal properties of the various component parts of eucalyptus oil differ widely. Hence the oils from different species have different medicinal values. Unless eucalyptol, the chief ingredient of blue gum oil, has the same effect upon the human system as phellandrene, the prominent ingredient of the peppermint tree oil, the oils from these two trees must necessarily have different medicinal properties, and the oil from a forest of mixed species must have very uncertain medicinal properties. The eucalyptus oil produced in America, where the groves from which leaves are obtained for oil are commonly of one species, and where,

with rare exceptions, a single species (blue gum) is the source of all the oil extracted, will necessarily be a product whose properties are better known and more constant than that produced from mixed native forest.—Pharm. Era, March 12, 1903, 272–273.

*Eucalyptus Kino—A New Variety.*—C. Mannich describes a new eucalyptus kino, the product of *E. drepanophylla*, as occurring in larger pieces of a brighter color than true *Pterocarpus* kino. Its taste is very astringent; it is fairly soluble in water, but more so in alkaline solutions. Since it contains much gum it is not very soluble in alcohol. Its aqueous solutions give a violet color with iron salts. It contains 0.09 per cent. of ash.—Pharm. Journ., Nov. 22, 1902, 523; from Journ. Pharm. Chim. [6], *16*, 216.

*Eucalyptus Leaves—Value of the Infusion in Glycosuria.*—A. G. Faulds has found that the infusion of eucalyptus leaves has a decided effect in lessening the excretion of sugar, and, in some cases, apparently, effecting a cure in diabetes. Having heard of the cure of a case of diabetes in Australia following the use of an infusion of fresh eucalyptus leaves taken as a remedy for influenza, the author was induced to experiment with a similar preparation from dried leaves in this country. Of forty-six cases treated fifteen showed a total disappearance of the disease. Oil of eucalyptus was not found to possess any action whatever.—Pharm. Journ., Aug. 9, 1902, 113; from Glasgow Med. Journ., *57*, 542.

ROSACEÆ.

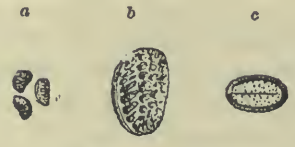
*Apples—Etymology of the Term and Origin of the Fruit.*—In notes on the origin of cultivated plants, F. H. Knowlton makes some interesting observations concerning the apple. Regarding the etymology of the word apple, he observes that, although the apple is now quite extensively cultivated in Mongolia and Thibet, there is no Sanscrit name for it, according to DeCandolle, and hence it is assumed that it was unknown to the Eastern Aryans. On the other hand, the Western Aryans appear to have found it, either wild or cultivated, when they swarmed toward the west, and we find applied to it the name they found or gave it. The root of this name was *ab*, *av*, *af*, *ap*, giving *aball* in Erse; *afal* in Kymric; *apfal* in old High German, and *appel* in old English. The Greeks gave to it the name *mailea* or *maila*, and the Latins *malus*, *malum*, words of which the origin is uncertain. The scientific name of *Pyrus malus*, or *Malus malus*, as the rules of nomenclature now require, is, of course, from the Latin. It is said that there are between four and five thousand varieties of apples known at the present time, but whatever the number, size, quality or appearance, they have all been derived from two stocks—the common apples from *Pyrus malus*, and the crab-apple from *Pyrus baccata*. The apple, par excellence, is the fruit of *Pyrus malus*. It grows wild throughout Europe, in the southern part of the Caucasus and in some parts of Persia. In the moun-

tains of the northwestern portion of India it was found by Sir Joseph Hooker in an apparently wild state, but it does not appear to be found in Siberia, Mongolia or Japan. The cultivation of the apple undoubtedly began in prehistoric times, as it is found abundantly in the remains of the lake-dwellings of Switzerland, and that representing a time before the inhabitants possessed metals. From Greek and Roman history we learn that the apple was early known in these countries, having been introduced into Rome in the time of Appius Claudius (449 B. C.). According to Pliny the Younger, who flourished during the end of the first and the beginning of the second centuries, it was grown in orchards; he speaks of twenty-two distinct kinds under the names of Claudians, Pompeians, etc.—Merck's Rep., Dec., 1902, 465; from "The Plant World."

*Apricots—Proximate Examination.*—Desmoulières has examined the coloring matter and sugars contained in apricots. He finds that the former can be removed from both acid and ammoniacal solution by amyl alcohol, and appears to be identical with carotin. The sugars extracted were saccharose, invert sugar and glucose, the proportion of the latter being small in ripe fruits, but larger in unripe fruits (0.353 and 0.771 per cent. respectively).—Pharm. Journ., Sept. 13, 1902, 275; from Bull. des Sci. Pharm., *4*, 235.

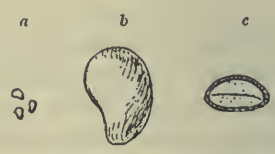
*Blackberry Seeds—Concise Description.*—Dr. E. M. Holmes describes

FIG. 50.




Blackberry Seeds.

FIG. 51.




Strawberry Seeds.

the seeds of blackberries, *Rubus fruticosus*, L., as being about 4½ Mm. long, 3½ Mm. broad, and about 2 Mm. in thickness, somewhat reniform in shape, compressed, and externally marked with irregular, dark reticulations, so that under an ordinary lens the markings can be distinguished. A double ridge runs round the seed, but is not distinct on the concave edge. A transverse section is shown under a powerful lens to be composed of two cotyledons without albumen. The seeds (endocarps) are about 5 Mm. long, 4 Mm. broad, and a little over 2 Mm. thick. When obtained from faeces they are usually of a purplish tinge. Fig. 50, at *a*, shows them in natural size; at *b*, magnified 4 diam., and at *c*, in transverse section.

*Raspberry Seeds* are exactly similar in character, but are yellowish.

*Strawberry Seeds*, *Fragaria elatior*, are very small, being only about 3 Mm. (? Rep.) long, 2 Mm. broad, and 1½ Mm. deep. They are reni-

form in outline, with a slightly tapering but obtuse apex. The transverse section shows indistinctly two cotyledons; the outer surface is smooth. Fig. 51, at *a*, shows strawberry seeds in natural size; at *b*, magnified 8 diameters; and at *c* in transverse section.—Pharm. Journ., Jan. 3, 1903, 6.

*Quillaia Bark—Histological Characters.*—W. Mitlacher gives a very complete account of the anatomy of quillaia bark, and accompanies it by illustrations, attention being drawn particularly to the very remarkable and characteristic bast fibres, which are colored pale red by dilute sulphuric or hydrochloric acid, a reaction ascribed to the presence of phloroglucin. The large and numerous prismatic crystals of calcium oxalate, the irregular bast fibers, and their coloration by dilute mineral acids, serve to characterize the powder.—Pharm. Post, 1902, 749.

LEGUMINOSÆ.

*Acacia—Physical Changes after Collection.*—A. Goetze describes the changes that occur in gum arabic after its collection. The pieces at first are transparent and glassy, but when exposed to sun heat (or artificial heat) they dry and, as a result of their brittle nature, crack. Such cracked pieces are nearly snow-white and easily break up. Senegal gum is exposed to a less intense heat, and the gum itself is less brittle; it contains, therefore, fewer cracked pieces and broken fragments. Cape gum in this respect resembles Kordofan gum, and is easily disintegrated. Indian, Persian, Australian and South American gums, on the other hand, dry less and are tougher, and hence break up less easily.—Pharm. Ztg., 1903, 119; from Wien. Drog. Ztg.

*East African Gums—Characters and Composition.*—C. Mannich has examined specimens of gum from German East Africa. That of

*Acacia Verek* occurs in pieces of varying size and color. The percentage of ash varies with the depth of tint of the gum. Pale tears contain 2.622 per cent.; brown pieces, 3.22 per cent. The optical rotation of a 10 per cent. solution, in a tube 100 Mm. long is, −1.1°. It contains no bassorin. *Acacia Kirkii* gives colors, grains, and pieces of gum, free from bassorin. Ash, 2.56 per cent.; rotation + 2.6°. The mucilage is of good adhesive power, and faintly acid. *Acacia Seyal.* Size and color of gum variable. Contains but little bassorin. Mucilage does not precipitate basic lead acetate. Ash, 1.70 per cent.; rotation, + 5.0°.

*Acacia spirocarpa.*—The transparence, amount of ash, and optical rotation of this gum varies with the age of the trees yielding it. That from adult trees is of good appearance, pale and translucent, contains 1.8 per cent. of ash, and has the rotation −2.6°. That from younger trees occurs in small, opaque tears, contains 3.022 per cent. of ash, and has the rotation + 1.4°.

*Acacia Arabica* yields a pale gum in pieces the size of a nut, traversed

by numerous fissures. It contains a small amount of bassorin. Ash, 1.55 per cent.; rotation, + 7.98°. Its mucilage does not precipitate with basic lead acetate, nor with ferric chloride.

*Acacia stenocarpa* gum is confounded with that known in commerce as Sennaar or Suakim gum. It contains bassorin; ash, 3.76 per cent.; rotation, + 4.75°.

*Acacia usambarensis* yields a gum in brown masses of agglomerated tears with a glassy fracture. Like tragacanth it swells in water. A 1 : 10 mucilage is of a somewhat gelatinous consistence. It contains much bassorin together with arabin; ash, 1.93 per cent.

*Berlinia Eminii* affords another tragacanth-like gum in horny, opaque, brown pieces with a slight, peculiar odor. A 1 : 10 mucilage forms a thick jelly; diluted to 1 : 50 it forms a slightly acid solution which precipitates with neutral lead acetate. It contains no starch; ash, 5.78 per cent. A gum of unknown botanical origin, distinguished by a green reflection when viewed in large pieces, furnishes a good colorless mucilage of great adhesive power. Rotation, –0.78°; ash, 3.692 per cent. The optical rotation above indicated is, in each case, that of a 10 per cent. aqueous solution, taken in a tube 100 Mm. long.—Pharm. Journ., Nov. 15, 1902, 491; from Pharm. Chim. [6], *16*, 214.

*Balsam of Peru—Inefficacy as an Antiseptic.*—Piorkowski has subjected balsam of Peru to tests which prove it to possess very feeble antiseptic properties, and such as it has are due to its cinnamic acid content. Cinnamein and styracin, which are the other supposedly important constituents of the balsam, are only slightly more effective. The therapeutic value of the balsam is considered to be mainly due to the effective protective covering which it affords when applied to wounds.—Ber. d. d. Pharm. Ges., 1902, 386.

*Balsam of Tolu—Commercial Variation.*—John Barclay calls attention to the variable quality of the balsam of tolu found in the English market. In the examination of seven samples the proportion of matter soluble in 90 per cent. alcohol varied from 74.7 to 86 per cent.; the free balsamic acids ranged from 8.8 to 18 per cent., while the corresponding combined acid showed percentages of 7.69 to 26.62 per cent. These figures show the importance of standardization of the preparation into which the drug enters on the lines suggested by the author in connection with benzoin (which see). He also calls attention to the unsatisfactory character of the official (B. P.) test for this drug.—Pharm. Journ., Feb. 28, 1903, 272.

*Cativo—A New Oleo-Resinous Product from Columbia.*—E. M. Holmes calls attention to a viscid, oleo-resinous substance which, under the name of "Cativo," has recently been sent to London for sale from Cartagena in the United States of Columbia. It was supposed to be allied to copaiba in character, but it presents no similarity to balsam of copaiba, either in

consistence or odor. The taste is faintly bitter, but no flavor is perceptible. It is opaque, of a dirty, pale-brown color, and resembles bird-lime in its viscosity. From information received by Mr. Holmes, it appears possible that this product is derived from a species of *Prioria*, a genus closely allied to *Copaifera;* but the flora of the United States of Columbia is so little known that there is little hope of identifying this product. The specimen of "Cativo" under consideration has been examined by Mr. J. C. Umney, who gives the following description of its physical and chemical characteristics: It forms a yellowish-brown, semi-solid mass, having a peculiar, unpleasant odor. It consists chiefly of an acid resin, with a small proportion of oily matter, insoluble in alcohol of 90 per cent., but soluble in ether. Under the microscope it presents the appearance of an emulsion containing oil globules. It yields nothing to water, but is soluble to the extent of 83.5 per cent. in alcohol of 90 per cent. The alcoholic solution, after filtration, leaves on evaporation a yellowish-brown, sticky, transparent resin. Cativo has the following constants: volatile oil and moisture, 6.5; acid number, 126.5; ester number, 27.2; saponification number, 153.7; ash, 1.54.—Pharm. Journ., Sept. 20, 1902, 296.

*Copaiba—Commercial Examination.*—John Barclay reports that seven samples of copaiba examined for percentage of volatile oil gave a mean of 47.97, and two of the samples in question yielded a soft resin after removal of oil. In the matter of presence of gurjun balsam, the application of the official test to eighteen samples showed ten to be either suspicious in quality or undoubtedly adulterated. He considers it to be of the greatest importance that some more satisfactory tests of a quantitative character should be provided for the detection of impurities in this drug.—Pharm. Journ., Jan. 24, 1903, 97.

*East African Kinos—Source and Characters.*—E. Schaer reports upon the investigation of three specimens of kino which were brought from East Africa by Busse, in 1900–1901. Of these, only one appears to be closely allied to the Pterocarpus kinos, being obtained from a tree that has been ascertained to be a new species, and has been named

*Pterocarpus Bussei*, Harms. Its external characters resemble fairly closely those of Malabar kino, but the fragments are more regularly and sharply angular, and have numerous particles of bark adhering to them, indicating their probable collection as masses excreted from, and dried upon, the trunk of the tree. Cold water dissolved it slowly and incompletely, warm water almost entirely. Neither pyrocatechin nor kinoin could be detected in it, but its reactions were otherwise similar to those of Malabar kino, and it might be of use in pharmacy and for various technical purposes. The other two samples, derived from *Derris Stuhlmannii* and *Berlinia Eminii*, appeared to be less valuable, though possibly suitable for technical use.—Ber. d. d. Pharm. Ges., 1902, p, 204.

*N'Kula (or Cula)—Botanical Source.*—A red paint used in central Africa, especially on the western coast, has long been known under the name of "N'Kula" or "Cula," but its botanical source was uncertain. Prof. E. de Wildeman believes that he has now determined its origin as the wood of a new species of *Pterocarpus*, which he describes under the name of *Pterocarpus cabræ*, De Wildeman. It is near to *P. tinctorius*, which probably yields a similar color in Angola, where it is known by the name "Tacula," "Lucula," or "Hula." Possibly also these two are not the only species that yield the coloring matter, which is very generally used in central Africa for decorative purposes in fetish worship.—Pharm. Journ., Aug. 2, 1902, 85; from. Rev. des. Cult. Coloniales, July, 1902.

*Malabar Kino*—Alleged Presence of Kinoin.*—In 1878 Etti obtained from a sample of "Malabar" kino a crystalline substance which he named *kinoin*, and to which he attributed the formula $C_{14}H_{12}O_6$. He described it as being colorless, but when heated to 140° C. it was converted into a red substance, which he considered to be identical with *kino-red*, $C_{28}H_{22}O_{11}$, convertible by further heating to 160° C. into a second anhydride of kinoin, $C_{28}H_{20}O_{10}$. In the course of experiments undertaken for the purpose of explaining the cause of the gelatinization of tincture of kino, Edmund White found it desirable to re-investigate the chemistry of kino itself, and having secured some "Malabar" kino of undoubted origin endeavored to prepare kinoin by the process of Etti, which was deemed important because the commonly-accepted views as to the chemistry of kino are based upon Etti's work. He obtained a white crystalline substance, which, however, utterly failed to respond to the characters attributed by Etti to kinoin, and which proved in fact to be *protocatechuic acid*, and although no elementary analysis was made, owing to the paucity of his product, Mr. White considers it quite possible that the samples of kino upon which Etti's results were based was not really "Malabar" kino, but only a trade sample derived from an altogether different source.—Pharm. Journ., May 16, 676, 677.

### TEREBINTHACEÆ.

*Coriariæ—Toxic Principles.*—Dr. C. R. Marshall reviews the literature concerning the toxic principles of the somewhat ill-defined order Coriariæ, which, containing only one genus and about twelve species, has a wide geographical distribution. He, however, shows the various members of this order to contain closely allied toxic principles. The leaves of a European species, *Coriaria myrtifolia*, which have been used to adulterate senna, contain a crystalline toxic principle named "coriamyrtin." A similar principle, named "tutin," has been extracted from four New Zealand species of *Coriaria*. Another species, *C. atropurpureus*, found in

* See also *Eucalyptus kino* (under "Myrtaceæ") and *Myristica kino* (under "Myristicaceæ").

Mexico, is said to be intensely poisonous, but curiously enough, an Indian species, *C. nepalensis*, is found to be non-toxic.—Trans. Brit. Pharm. Conf., 1902, 438–442.

*Elemis—Identity of Constituents in the Different Sorts.*—In continuation of his studies of the different sorts of elemi, Prof. A. Tschirch, in conjunction with J. Cremer, communicates the results of an analysis of a

*Brazilian Elemi*, a small quantity of which was received from Dr. Peckolt. This kind of elemi is the product of *Protium heptaphyllum* and probably other species of *Protium*, and is not an article of commerce, being used locally in some of the villages as a substitute for incense. The sample under consideration occurred in brown pieces, internally white, and about the size of a bean; was almost odorless, and admixed with cortical matter. It yielded 75 per cent. of pure resin, which was completely soluble in warm alcohol, ether, acetic ether, acetone, chloroform and toluol, partly soluble in petroleum ether, carbon disulphide, methyl alcohol, carbon tetrachloride and 80 per cent. chloral-hydrate solution, and was composed of 30 per cent. prot-amyrin, 25 per cent. prot-elemic acid, 37.5 per cent. prot-elemiresen, together with small quantities of volatile oil and bitter principle. The presence of bryoidin could not be determined. The prot-amyrin agreed in its melting point (170°–171°) and its elementary composition with the amyrin obtained from the other four sorts of elemi heretofore examined and described, namely, the amyrin from Manila elemi (soft), Manila elemi (hard), Yucatan elemi (from Central America) and African elemi (from the Cameroon). Like these amyrins, also, prot-amyrin is composed of two isomeric alcohols, $\alpha$- and $\beta$-amyrin, $C_{30}H_{50}O$. In fact the elemis obtained from widely-different localities as well as botanical sources, are essentially of the same composition—the Manila elemis and the Brazilian elemis being derived from Burseraceæs; the former from *Canarium commune*, L., the latter from a closely-related *Protium*, whilst the Yucatan elemi is derived from an *Amyris* which belongs to the Rutaceæ. —Arch. d. Pharm., *240*, No. 5 (July 25, 1902), 321–324.

*Carana Elemi—Constituents.*—In conjunction with O. Saal, Professor Tschirch has also subjected the elemi derived from *Protium carana* to examination. It contains isocareleminic acid, $C_{40}H_{56}O_4$, which is amorphous, melting at 75° C., 2 per cent.; this is removed by shaking out the ethereal solution of the resin with $(NH_4)_2CO_3$ solution; careleminic acid, $C_{40}H_{56}O_4$, which crystallizes from a mixture of methyl and ethyl alcohol in well-formed needles, melting at 215° C., 8 per cent.; carelemisic acid, $C_{37}H_{56}O_4$, which is amorphous, melting at 120° C., 10 per cent.; both these are removed after the elimination of the isocareleminic acid, by shaking out with the 1 per cent. NaOH solution. Carelemisic acid is separated from the mother liquor after removing careleminic acid by crystallization. The residue, after the removal of these three acids, gives, when steam-

distilled, 10 per cent. of essential oil. This is a fragrant, yellow liquid with an odor recalling that of a mixture of fennel, dill and lemon oils. On fractionation it gives a colorless, pleasant-smelling fraction between 170°–172° C.; a denser yellow fraction between 172°–200° C., and at higher temperatures, a viscous, brownish, acrid product. Strong $H_2SO_4$ gives a cherry-red color reaction with the first fraction. The resinoid residue of the steam distillation gives caramyrin, $C_{30}H_{50}O$, melting at 175° C. It is separable into $\alpha$- and $\beta$-amyrin, the former melting at 181° and the latter at 192° C. Caramyrin is identical with the amyrins isolated from other elemis. The two amyrins are separated by taking advantage of the different solubility of their respective benzoic esters in alcohol, 80 per cent.; $\alpha$-amyrin benzoate is soluble, $\beta$-amyrin benzoate insoluble, in that solvent. The mother liquor, after crystallizing out the caramyrin, contains the indifferent careleresene, $C_{27}H_{40}O_2$, which is amorphous and melts at 75°–77° C. It forms from 30 to 35 per cent. of the original elemi, which also probably contains traces of bryoïdin.—Archiv. der Pharm., *241*, No. 2 (March 23, 1903), 149–159.

PIPERACEÆ.

*Piper Famechoni—A New Pepper from the French Soudan.*—A new pepper, a native of the French Soudan and Upper Guinea, has lately been discovered by Heckel, and named by him *Piper famechoni*. It has been used by the French troops in Equatorial Africa as a condiment. The fruits are brownish-black, very variable in size and shape, having a persistent pedicel, like cubebs. They are generally smaller and lighter in color than the fruits of the common black pepper. A. Barillé has submitted them to chemical examination and finds that they yield the following constituents in percentages: Water, 14.604; ash, 4.550; volatile oil, 4.470; piperin, 3.654; starch, 38.004; cellulose, 10.009; glucose, 5.208; saccharose, 1.663; albuminoids, 10.253; extractive soluble in alcohol, 19.250; extractive soluble in water, 10.076; tannin, 0.260; gum, pectin, coloring, and soluble nitrogenous matter, 5.275; resin and fixed oil, 3.995; total nitrogen, 1.820 per cent. When ground, the fruits give a reddish-brown powder of marked fragrance. The volatile oil is very aromatic; the major fraction boils between 255° and 260° C.—Pharm. Journ., Aug. 16, 1902, 128; from Comptes rend., *134*, 1512.

*Long Pepper—Constituents.*—A. Wangerin has determined the following constituents in long pepper: Volatile oil, 0.90; piperin, 0.20; piperidine, 0.19; albuminoids, 8.81; fat, 6.70; soluble carbohydrates, 4.19; starch, 38.80; cellulose, 9.9; non-nitrogenous extractive, 6.66; ash, 7.15; and water, 10.50 per cent.—Pharm. Ztg.

*White Pepper—Sophistication by Manipulated Black Pepper.*—H. Kreis calls attention to the presence in commerce of pepper coated with a small quantity of lime which enables Penang pepper to pass as a white pepper

of higher grade and greater intrinsic value. The fruits are normal in size, but present a rougher surface than genuine white pepper. The fraud appears to be conducted abroad, where the pepper is grown. Decortication is rendered more easy by macerating the fruit in milk of lime, after which the grains are coated with the lime and dried.—Schweiz. Woch. für Chem. und Pharm., *40*, 309.

RHAMNACEÆ.

*Cascara—Tasteless Preparations.*—Edmund White and R. A. Robinson, Jr., after experimenting with numerous published formulas for disguising the bitter taste of liquid extract of cascara, arrived at the conclusion that none of the products were very satisfactory. After various experiments they exhausted some cascara by percolation with water, and divided the percolate into three parts. The percolate was strongly acid to test paper; one part was rendered strongly alkaline with potassium hydroxide, another with strong solution of ammonia, and the third with sodium bicarbonate, using the alkalies in equivalent proportions. The three products were evaporated, and after about three hours were rendered tasteless, the evaporated products being dark and clear and miscible with water without precipitation. The products were still active, although from the inherent difficulties of such observations it could not be definitely stated that their activity was equal to that of the original bitter extract. Some time ago E. Aweng recommended the evaporation of the percolate after addition of ammonia, precipitation of the bitter substance with lime, and subsequent removal of the excess of lime by means of tartaric acid. In the experience of the authors the treatment may be simplified by adding for each 100 Cc. of finished extract 5 grammes of potassium hydroxide, or 7 Cc. of strong solution of ammonia, heating on a water-bath for three hours, or until the bitterness has disappeared, and finishing off the product in the usual way. Sodium bicarbonate was found to be less effectual than potassium or ammonium hydroxide. The addition of lime or magnesia to the powdered bark before percolation was formerly recommended for the production of tasteless extracts, but such products appeared to be weaker than the official bitter extract. If experience shows that the product obtained by treating the bitter extract with potash or ammonia retains its activity unimpaired, it would indicate that the calcium or magnesium salt of the purgative principle, being insoluble in water, is retained in the marc, while the potassium or ammonium compound is soluble and still active. The authors furthermore have observed that if the liquid extract of cascara is simply neutralized with potassium hydroxide, it will regain its acidity on warming, and this may be repeated with the same result a number of times until as much as 2.16 Gm. of potassium hydroxide has been added to 100 Cc. of the previously neutralized liquid extract. But even then permanent alkaline reaction or entire loss of bitterness is not attained. If, however, 5 Gm. of

potassium hydroxide was added all at once, the bitterness rapidly disappeared on warming, and the product was left slightly alkaline. The time required for removing the bitterness thus appears to vary inversely with the proportion of free alkali present, a result most easily explained by the assumption that the bitter substance is an anhydride or lactone.—Trans. Brit. Pharm. Conf., 1902, 420–422.

EUPHORBIACEÆ.

*Euphorbiaceæ—Anatomical Distinction of the Sub-Orders.*—The *Euphorbiaceæ* show several interesting anatomical characteristics, *e. g.*, laticiferous tubes, tannin ducts, internal phloem, and water-storage tissue. According to the results obtained by Gaucher, the three sub-orders of the group differ in the following respects: In the *Phyllanthoideæ* latex tubes and internal phloem are both wanting, but tannin ducts are present in considerable quantity, and water-storage tissue is formed at the expense of the epidermis. The *Crotonoideæ*, on the contrary, possess latex tubes and internal phloem. No water-storage tissue is formed, but evaporation is checked by a well-developed system of hairs. The *Stenolobieæ* have some characters in common with each of the previous sub-groups, for latex tubes occur, but internal phloem is not found; and some genera have definite water-storage tissue, while others depend upon a plentiful supply of hairs. —Pharm. Journ., Nov. 8, 1902, 463; from Annales des Sciences Naturelles, *15*, 161.

*Cassava—Cultivation.*—R. Thomson brings forward evidence to show that the systematic cultivation of cassava on a large scale should prove exceedingly remunerative. Cassava is eminently a drought-resisting plant, requiring only about 14 to 16 inches of rain per annum, but it will flourish under a wide range of climatic conditions, and on a small scale has already yielded satisfactory results in Jamaica. The yield of tubers should be from 8 to 10 tons per acre, and a double crop is obtainable. The market for cassava is to be found in the manufacture of starch. It yields about 20 per cent. of starch as compared with 53 per cent. from corn. But the amount of starch produced per acre from cassava tubers is about three times as much as from corn, and the cost of production is only one-quarter. Besides starch, tapioca and sugar-starch are products, while another profitable use for cassava is to feed pigs and cattle, because not only is it cheaper to buy, but the animals thrive on it and produce more meat than when fed on corn.—Pharm. Journ., Jan. 10, 1903, 29; from Bulletin of Botanical Department, Jamaica, *9*, 81.

*Croton Oil—Detection in Tincture of Iodine.*—Darien suggests the following simple method for the detection of croton oil in tincture of iodine: Dilute 10 Gm. of the suspected tincture with 70 Gm. of water, add iron filings in excess, and after the conversion of the iodine into ferrous salt is completed, shake the mixture with a small quantity of ether and decant.

On evaporating the decanted ether, any croton oil present in the tincture remains as residue, and this may be tested for its identity by its action on the skin, odor, and brown coloration with sulphuric acid.—Pharm. Centralh., 1902, 477; from Bull. d. Sciences Pharmacol.

*Richeria Grandis—Chemical Constituents.*—P. Lemaire has examined the bark of *Richeria grandis*, which, under the name *Chalufouria racemosa*, "Bois bander," "Bois d'homme," and many other names, has a wide reputation as an aphrodisiac. The author finds, however, that this is ill-founded. It contains no alkaloid or any other active principle. Petroleum ether removed from it a crystalline body, occuring in hexagonal scales melting at 237° C., but which were devoid of physiological action. Besides this, nothing but reddish-brown coloring matter, tannin and glucose were isolated.—Pharm. Journ., Dec. 27, 1902, 695; from Répertoire [3], *14*, 496, and Gaz. des Sciences Méd. de Bordeaux.

URTICACEÆ.

*Cannabis Indica—Distinction of the Drug as Supplied Under Different Names.*—Referring to his previous paper, in which he directed attention to the great variation in the strength of cannabis indica, as supplied in the London market (see Proceedings, 1902, 888), Dr. E. M. Holmes publishes some highly interesting facts concerning the cultivation, preparation, storing and uses of this important East Indian drug, the source of his information being a "Report on the Cultivation and Uses of Gánjá," received through the courtesy of Dr. D. Prain. The details concerning the cultivation, etc., must be consulted in the original paper of Dr. Holmes, but the following description of the drug, as supplied and known under different names, may properly go on record here, as follows:

*Guaza* is the term applied by drug-brokers in England to the ganjah which comes from Bombay, which is inferior in quality to that from Calcutta, the heavy duty on the latter preventing its competition with the Bombay drug.

*Bhang* consists of the selected leaves of the plant, dried and broken up into coarse powder, the leaves being obtained from plants that are not carefully manured or cultivated, as they are for ganjah. The lower leaves, often soiled and inert, are avoided, and the flowering tops are not necessarily added. For good qualities, the leaves are collected at the right time, when the resin is most abundant, and the leaves of male plants are not taken, nor are those of non-resinous female plants.

*Haschisch.*—The word which literally means "the plant," is used in Syria, Turkey and Egypt to indicate bhang, churrus and also alcoholic preparations of the plant.

*Májún* is a term applied to a sweetmeat or confection, of which Indian hemp is the basis, but it may contain nux vomica, opium, cantharides or frequently datura seeds, according to the purpose for which it is intended, whether as an aphrodisiac or a criminal excitant or deliriant.

*Charas*, or *Churrus*, is the resin obtained from the flowering tops, collected in different ways in different districts. It forms a greenish-brown, moist, resinous mass, containing 22 to 25 per cent. of vegetable *débris*. It is obtained chiefly from cultivated female plants.

*Gánjá.*—This is the most important preparation of the plant from the point of view of medicine and pharmacy. It is obtained exclusively from highly-cultivated plants, and consists of the flowering tops of the female plant, deprived as much as possible of leaves.—Pharm. Journ., Aug. 16, 1902, 129, 130.

*Cannabis Indica—Review of Recent Observations Concerning its Constituents and their Activity.*—In a paper read before the British Pharmaceutical Conference at Dundee (1902), Dr. C. B. Marshall reviews the more recent pharmacological work on cannabis indica, the present paper being in some respects a continuation, or rather amplification of the one read by him at the Conference in 1901 (see Proceedings, 1902, 888). He maintains the opinion that the red, oily body, for which the name

*Cannabinol* was suggested by three Cambridge chemists, Wood, Spivey and Easterfield, produces in a marked degree the intoxication of Indian hemp in doses of 1½ grains, a distinct action being obtained even with ⅓ grain. But it seems also evident that this is not a single substance, since the purified cannabinol, to which the formula $C_{21}H_{26}O_2$ has been assigned, had practically no physiological action. Furthermore, the activity of cannabinol appears to be destroyed by exposure to air (oxidation), a resinous body being formed, and eventually it is converted into an inert, brittle, pitchy mass. This conversion was accomplished completely when a current of oxygen was passed through cannabinol for nineteen hours, whereas a sample treated in the same way with carbonic dioxide showed practically no change.—Trans. Brit. Pharm. Conf., 1902, 399–400.

*Cannabis Indica—Not Poisonous in the Ordinary Sense.*—Thomas Maben read a paper before the Dundee meeting of the Brit. Pharm. Conference on the physiological action of cannabis indica, which is based on observations communicated to him in the course of a discussion with H. C. Hamilton, who is regarded in the United States to be an expert on this subject. Mr. Hamilton, who has made physiological tests with the drug on dogs, finds that insensibility of the animal rarely occurs, except from immense doses of the drug, and he has never known death to ensue in any case. Furthermore, much seems to depend on idiosyncrasy, an extract of cannabis active in the one case being apparently inactive in another, or on the same animal at another time. Finally, Mr. Hamilton believes that the "cannabinol" prepared according to Wood, Spivey and Easterfield's process is not the active principle of cannabis; and further that, so far as our present information extends, the active principle has not yet been isolated.—Trans. Br. Pharm. Conf. 1902, 401–408.

CUPULIFERÆ.

*Cork Oak—Cultivation in Australia.*—J. H. Maiden suggests that this is an article of sufficient importance for the plant yielding it to receive more attention in the British colonies than has hitherto been done. He offers five hundred young plants, in lots of twelve without charge, for experimental planting, provided reports are made in two or three years of the probable suitability of the tree to the district where it is sent.—Pharm. Journ., Nov. 29, 1902, 550; from Agric. Gaz., N. S. W.

*Cork—The World's Production.*—The "Detail-Handler" states that the cork production of the world is narrowed down to Portugal, Spain, France, Italy, Tunis, Algeria and Morocco. The area over which the culture extends is about as follows: Portugal, 600,000 hectares; Spain, 300,000 ha.: Italy, 80,000; France and her African possessions, 661,000 ha., of which 426,000 are in Algiers and 82,000 in Tunis. The cork-oak grows in forests in company mostly with firs and evergreen oaks, but in a part of Tunis there are forests consisting entirely of cork oaks. The bark of these Tunisian forests is said to be of an extraordinarily excellent kind. France, Great Britain, Germany and the United States receive about 85 per cent. of the total production of cork. Germany, Russia and the United States have no prohibitory duties on importation of cork and cork goods, and admit the material free or with only a trifling impost. Great Britain also permits of the free entry of cork, and draws most of its supplies from France, Spain and Portugal. The last named takes the chief place in cork production, producing nearly one-half of the total growth of the bark—about 450,000 quartels out of the million produced. The greater part of this, perhaps three-fourths, is the crude bark, while the remainder is in manufactured stoppers. Spain exports only manufactured wares.—National Drug., Nov., 1902, 326.

*A New Corkwood Tree—Occurrence in Nicaragua.*—Prof. F. D. Baker, of the Stanford University, has made an extended trip to Central America, where he has made a very careful study of the forests of Nicaragua. The most important discovery made was the finding and classification of a tree from which a substitute for cork has been derived. Prof. Baker found the woods of Nicaragua to contain three hundred distinct varieties of trees. For the last few years a bark which is a good substitute for cork has been shipped to the United States, but it has never been scientifically ascertained from what species of tree this bark has been obtained. Prof. Baker found that the bark came from the roots of the

*Anona*, a tree that very closely resembles the ordinary cottonwood of the United States. The anona grows along the water courses and in the lowlands. A more elaborate report is promised in the near future.—Canad. Pharm. Journ., May, 1903, 455; from Scient. Amer.

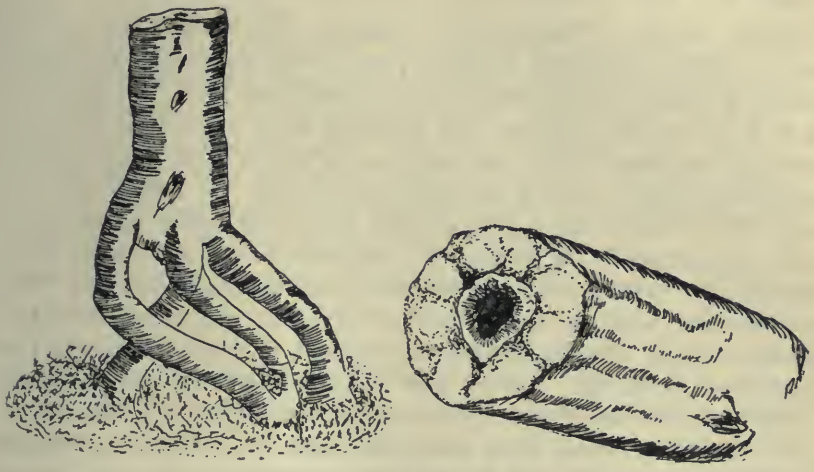
*Leitneria Floridana—The Lightest Wood.*—It is stated in "Plant

World" (v, 113), that deep in the bogs and swamps of southeastern Missouri, where the land is never dry, and water from one to six feet deep stands perpetually in the forests, there grows a rare and curious tree. The natives know it as the corkwood or cork tree. Science has given it a longer name, the *Leitneria Floridana*, because it was first discovered in Florida, along the coast, from which it has long since been washed away. Some meager specimens of it, 2 to 6 feet high, are still found in the swamp near Apalachicola, Fla., and a few near Varner, Ark., but in both these places it is exceedingly limited in numbers, an occasional specimen being found and hardly rises to the dignity of a tree. Only in southeast Missouri, where it reaches a height of 15 to 20 feet and a diameter of 2 to 5 inches, is it really a tree. What makes corkwood so remarkable is its exceeding lightness. Beyond a doubt it is the lightest tree in weight that grows. Its wood weighs less than cork. It is so light that the natives use it to make floats for their fishing nets. And yet its wood, though so spongy one may easily sink one's finger in it, is far tougher than cork. The specific gravity of corkwood, as learned from careful tests made by Prof. Nipher in St. Louis, is 0.207. The roots are even lighter than the stem; a test showed them to have the astonishingly low specific gravity of 0.151.—Merck's Rep., Sept., 1902, 357.

*Philippine Cork-Wood Tree—A Substitute for Cork Bark.*—Because of the growing scarcity of cork materials, experimenters and prospecters have given time and study to the project of using the light woods of tropical climates for cork stuffs, for bottles, jars and vessels of all kinds. The correspondent of the "Oil, Paint and Drug Reporter" has taken occasion to investigate the light-wood situation in the Philippine Islands, the Sula Archipelago, Guam, and other islands in this portion of the Pacific Ocean, and the result proved the value of some of the native woods for cork stock. Taking cork itself, at 0.230 to 0.260 in lightness, most woods range from 0.500 to 0.800; but the light woods of the Philippines range in specific gravity from about 0.300 to 0.400. Among the different trees is one found in the deep bogs of the country, to which the Americans have applied the name of "Cork-wood tree," and the natives, having no special name for the growth, have adopted this title. It is of the type of *Leitneria Floridana*, being a tree about forty feet in height, growing in swampy places. It has a rather straight trunk, with protruding limbs about half way up, with heavy foliage, composed of large and numerous leaves. The roots of this tree possess some very singular root-plans, a view of one of which is shown in Fig. 52, which attracts attention by the roots extending in a most marvelous and weird fashion about the earth—the space between the roots being sometimes large enough for a person to pass through. The roots themselves are quite tough, but the wood some distance up the trunk is very pliable, soft, and suitable for cork-making. A section of the body portion of the tree is presented in Fig. 53, from which an idea of the physical con-

struction of the wood-fiber about the heart can be determined. Usually there is a cavity extending along the middle of the trunk. There are white ants living in these cavities and the ants live on the wood. In time the tree is greatly weakened by the inroads of the insects. The porous-like, soft, pliable and dry-fibered material makes cork stock, which is being

FIG. 52. FIG. 53.



Philippine Cork-Wood Tree.

used to advantage in domestic bottling establishments and for export. The correspondent also gives an account of the primitive methods employed in shaping the corks from this material.—Drug. Circ., March, 1903, 64.

CONIFERÆ.

*Turpentine—New and Profitable Method of Tapping Trees.*—The turpentine industry is receiving the benefit of a discovery by Dr. Charles H. Herty, an expert of the Bureau of Forestry, the importance of which may be realized by the enormous gains in profits it secures for the turpentine operator. By a new method of tapping trees, called the cup-and-gutter system, Dr. Herty has secured an increase over the old method of 23 per cent. of turpentine, besides uniformly high grades of rosin. Briefly stated the equipment consists of an earthen cup attached to the tree beneath its scarified face and serving to catch the resin which drips from the two galvanized-iron gutters above. The earthen cup takes the place of the injurious box or hole cut in the tree, but the new system may be applied to boxed as well as to unboxed timber. The cup-and-gutter system works to great advantage both for the turpentine operator and the owner of timber lands. It assures the former an immediate increased profit at very little additional expense, and benefits the latter by inflicting the least possible damage to his timber. The system has many additional advantages.

No change is necessary in the labor of cutting faces on the trees, in which the negroes of the turpentine belt are especially skillful. The placing of the equipment, which is extremely simple in construction and may be fitted to trees of all sizes, is easily done by the regular turpentine laborer. A method of turpentining that inflicts so little damage on the trees is an important factor in the problem of preserving southern timber lands.—Pharm. Era, June 11, 1903, 599.

*Rosin—Method of Sampling and Grading.*—The following description of the method of grading rosin, as given in an article on "The Art of Sampling Rosin," is of sufficient interest to find place here: The inspector goes in among, say 1,500 or 1,800 barrels of rosin scattered over a wide territory on a wharf. With the inspector go two or three gangs of men and young boys. There is one gang to "uncooper" or unhead the barrels. When this is done a piece of rosin at least six inches square is cut from the contents of the barrel. This is handed to the man who cuts out the samples. This is where the fine art of rosin-sampling comes in. This sample-cutter is an artist. He uses a sharp adz, and, taking the large piece of rosin of irregular shape in his left hand, he taps it gently with the sharp blade of the adz. This is done on four sides, and soon the rosin block begins to take shape. The chipping away of the rosin is kept up until a perfectly square block just a little short of an inch is produced. This is the rosin sample that is to be passed upon by the inspector. Hundreds of them can be cut with great rapidity, and when they are laid out together there will not be a difference of a sixteenth of an inch in their size. The sample is placed on the side of the barrel and the inspector comes by. Here is where his keen eye and his good judgment come into play. He carries with him a complete set of samples of the various grades of rosin. There are thirteen of them. The palest rosins are the most valuable, and as they get darker in hue they become less valuable. The newly cut sample is held to the light beside the sample and the inspector calls out the grade. It is put on record by an assistant and the inspector passes on to the next barrel, from which a large piece of rosin has been cut and the sample made from it. He grades this and goes on to another barrel. This is kept up until every barrel has been opened and sampled, and in this way it is quite possible for an expert examiner to pass upon 1,800 barrels, while some inspectors have passed upon as many as 2,600 in a day's time. Behind the inspector comes a man who coopers up the barrels of graded rosin, and another man weighs them and marks the weight on the side of the barrels.—Drug. Circ., Dec., 1902, 261; from the Savannah "Press."

*Coniferous Oleo-Resins—Chemical Investigation.*—In continuation of his previous investigation of coniferous secretions, A. Tschirch, in connection with F. Koritschoner, has subjected the resinous exudation of

*Pinus Palustris* to chemical investigation. The authors find the following constituents: Palabieninic acid, $C_{13}H_{20}O_2$, 5 per cent., removed from the ethereal solution of the resin by shaking out with ammonium carbonate solution; Palabietinic acid, $C_{20}H_{30}O_2$, 6 to 7 per cent., which is crystalline; $\alpha$- and $\beta$-palabietinolic acids, together 53 to 57 per cent. Both these latter are amorphous and are separated by the differing solubility of their lead salts. Palabietinic acid and $\alpha$- and $\beta$-palabietinolic acids are removed by shaking out with sodium carbonate solution. All the above are soluble in caustic soda solution. The portion of the resin insoluble in NaOH solution consists of essential oil, 20 to 22 per cent., and paloresene, 10 per cent., with traces of a bitter principle. The essential oil has a characteristic turpentine-like odor. The sp. gr. is 0.864. It is dextrorotatory, while the resin itself and palabietinic acid are lævogyre. The authors have furthermore examined Russian white pitch, a product known as "belji var," and probably derived from the Siberian fir,

*Abies pichta*, Forb., or *Picea obovata*, Ledeb. This contains two free resin acids, one of which is amorphous, the other crystalline. The former, beljiabieninic acid, $C_{13}H_{20}O_2$, is removed by shaking out the ethereal solution of the resin with ammonium carbonate solution. The yield is 4 to 5 per cent. Sodium carbonate removes beljiabietinic acid, $C_{20}H_{30}O_2$, 2.5 to 3 per cent., and also $\alpha$- and $\beta$-beljiabietinolic acids, $C_{16}H_{24}O_2$, together 42 to 50 per cent. Beljiabietinic acid, when pure, crystallizes in well-formed tabular crystals which melt when slowly heated between 153–154° C., or when quickly heated at 160° C. A 5 per cent. alcoholic solution is optically inactive. The $\alpha$- and $\beta$- beljiabietinolic acids were separated by the differing solubility of their respective lead salts. Besides the above, which are all soluble in soda solution, the pitch also contains, in the soda-insoluble portion, beljiresene, $C_{31}H_{36}O$, 15 to 18 per cent., and essential oil, 20 to 30 per cent. The boiling point of the latter lies between 158 to 160° C. It is dextrogyre and has the sp. gr. 0.863.—Archiv. der Pharm., *240*, No. 8 (Nov. 21, 1902), 568 to 596.

*American Colophonium—Composition.*—W. Fahrion finds that American colophonium consists principally of amorphous sylvic acid ($C_{20}H_{30}O_2$) which is easily converted by dilute alcohol into the isomeric crystalline acid, which by long heating passes back into the amorphous condition. It is easily oxidized, yielding oxysylvic acids, $C_{20}H_{29}(OH)O_3$ and $C_{20}H_{28}(OH)_2O_4$, which are soluble in petroleum ether. Further oxidation yields bodies of unknown nature which are insoluble in petroleum ether. Colophonium also contains a small quantity of a saponifiable substance, probably an anhydride, soluble in petroleum spirit. Pharm. Journ., Mar. 21, 1903, 417; from Ztschr. f. Unters. Nahrungs u. Genussm., *6*, 80.

*Dammar Resin—Yield and Properties of Volatile Oil.*—According to H. Haensel, dammar resin yields on distillation 1.06 per cent. of volatile oils, of a golden-yellow color, very bitter, soluble in benzol, chloroform,

carbon disulphide, acetic ether and absolute alcohol. Sp. gr., 0.9352 at 21° C.; it is optically inactive, and begins to distil at 205° C. Sixty per cent. distils over at 240° C.; this fraction has the sp. gr. 0.9157; another 30 per cent. distils at 265° C. The dammar residue is resinous.—Pharm. Post, *35*, 715.

*Shellac—Review of its Chemistry and Analysis.*—E. J. Parry criticises the chapter on the chemistry of shellac contributed by Mr. David Hooper in a pamphlet on "Lac and the Lac Industries," by Dr. Geo. Watts, the reporter on economic products to the Government of India. This criticism covers the methods of detecting rosin, the proved methods of analysis, the constants, and the chemistry of shellac proper, but is too voluminous for abstraction and must therefore be consulted in the original, in Chem. and Drug., Jan. 31, 1903, 175–178.

*Cryptomeria Japonica—Characters of Volatile Oil.*—C. Kimoto communicates the results of examination of the essential oil of *Cryptomeria Japonica*, a tree widely distributed in Japan. The wood owes its pleasant odor, reminding of peppermint, to an essential oil which the author obtained by steam distillation of chips of the wood. This oil contains a body $C_{30}H_{48}O$, a neutral liquid of the boiling point 264°, and a specific gravity 0.935, which the author has called "sugiol," after the Japanese name of the plant. Sugiol is almost insoluble in water, but dissolves readily in alcohol, ether, and chloroform; it has the property of slowly reducing an alkaline silver solution in the dark. A crystalline acetyl or hydrazone compound of the substance does not exist.—Schimmel's Rep., Oct.–Nov., 1902; from Bull. Coll. Agric. (Tokio), *4*, 403.

*Juniperus Sabina—Characters.*—In a thesis on the anatomical structure of the various species of *Juniperus*, Dr. H. Mongin gives some useful notes on the structure of savin leaves *(Juniperus sabina)*. He remarks that Tschirch, in his "Anatomie des Plantes," does not represent the special bands of strengthening cells which occur on either side of the vascular bundle, although they are described by J. Moeller, in 1901, under the name of "Balkenzellen." E. Collin, on the other hand, states that stomata occur on the lateral faces of the leaf, as seen in transverse section, but Dr. Mongin shows that they never occur there but on the flat or posterior surface only. He also states that the oil cell is always beneath the epidermis, but not underneath the hypoderm, as M. Collin represents. Dr. Mongin is of opinion that the only species that occur as an adulteration of savin in France are *J. phœnicea* and the var. *gallica* of *J. thurifera*, which are common in Dauphiny and Provence. *Juniperus phœnicea* contains an essential oil identical with that of *J. communis*. It can also be distinguished in transverse sections of the stem by the fact that the leaves are imbricated in a spiral of five, which can easily be seen by a lens in a series of successive sections, generally three, but sometimes four or five, being

visible in a section; two are quite exceptional. In the mesophyll there are numerous large, stone cells, which are absent from the leaves of savin. In the leaves of *J. thurifera* var. *gallica* and those of savin there are present in transverse section always two opposite leaves, and sometimes the rudiments of another pair of opposite leaves above them, but unlike savin, *J. Thurifera* var. *gallica* has stone cells in the mesophyll, In this country, where *J. Sabina* is not a native, but is cultivated, *Juniperus Virginiana*, which more closely resembles savin, is likely to be mistaken for it. In this species the transverse section shows sometimes two and sometimes three leaves in the same branch, but always stone cells in the mesophyll, as does also *J. Bermudiana*. Those species have not the flavor of savin.—Pharm. Journ., Nov. 8, 1902, 463.

*Thuja—Fertilization*.—W. J. G. Land observes that while there is complete uniformity in the general scheme of pollination and fertilization which characterizes the Coniferæ, detailed observations have revealed small features of distinction between the various genera which promise to prove valuable. Such a character is found by the author in the case of *Thuja*, in the ventral-canal cell, which is not walled off from the ovum, and further, the nucleus may persist and divide whether the ovum is fertilized or not. The period of fertilization is rather earlier for *Thuja* than for *Pinus*—beginning early in June and completing on about the 20th.—Pharm. Journ., Feb. 21, 1903, 233; from Bot. Gaz., *34*, 249.

CYCADEÆ.

*Cycas Circinalis—Poisonous Glucoside in the Fruits*.—J. Van Donjen has made a chemical examination of the fruits of *Cycas circinalis* which are regarded in the Dutch East Indies as being poisonous. He obtained from the seeds a poisonous glucoside which he has named

*Pakoëine*, after the native name of the plant "Pakoe Hadji." It was obtained in an amorphous condition as a light-yellow powder, soluble in water and diluted alcohol, but insoluble in alcohol, ether, chloroform, benzol, methyl alcohol, acetone and petroleum ether. It does not contain nitrogen. With tannin it gives a precipitate soluble in excess. A mouse, to which a small quantity of the glucoside, dissolved in water, had been given on bread, died in twenty-four hours.—Pharm. Journ., May 2, 1903, 614; from Pharm. Weekblad (4), *16*, 309.

## B. Animal Drugs.

*Leeches—Primitive Culture in Michigan*.—J. L. Lemberger, speaking of the methods of keeping leeches, gives the following description of the expedient employed by a Michigan physician as far back as 1837. Having found it difficult to procure leeches, or to secure their safe transportation from New York, he contrived a plan to make a tank eight feet long by six

feet wide by four feet deep, placing this in moist or marshy ground near a stream of water, putting about nine inches of cobble into the tank and running water into it, so that it is kept fresh, receiving the water in the bottom of the tank with an outlet near the top. Both openings had to be protected by a wire cloth or screen to keep the leeches from escaping. He put some leeches into this receptacle and soon found with a little attention that he not only had a good stock, with very few casualties, but made quite a business of raising stock for sale. The cobble stones placed in the bottom of the tank afford refuge and by continual contact with the stones rids them of the slimy deposit that seems to be the natural menace infecting them and causing disease. With this treatment and a few frogs occasionally thrown into the tank about once a week feeds and sustains them. When thus cared for they breed freely, produce eggs during the months of June and July, and mature in two years, increasing the family very rapidly. When ordinary care is given they thrive and live fifteen years.—Proc. Pa. Pharm. Assoc., 1902, 126.

*Leeches—Preservation by the Aid of Lime Water.*—Beaulieu recommends that leeches should be put into well water containing 30 Gm. of lime water per liter, immediately on arrival. Then, after several hours, they should be transferred to an earthenware vessel containing water with 10 Gm. of lime water to a liter, and this changed daily with water hardened in the same way.—Schw. Woch. f. Ch. and Ph.

*Beeswax—Commercial Examination.*—John Barclay reports that out of ten samples of beeswax examined during the year two proved to be adulterated, one showing a specific gravity of 0.988 and a melting point of 57.5 C., the other having a specific gravity of 0.872 and containing a quantity of paraffin. The following figures, giving a comparison of the results obtained on pure samples of white and yellow wax respectively, may be of interest:

| | White Wax. Mean of 5 samples. | Yellow Wax. Mean of 5 samples. |
|---|---|---|
| Specific gravity | 0.969 | 0.966 |
| Melting point | 62.1 | 63.0 |
| Caustic potash required for neutralization of free acid in 5 grammes | 1.69 | 1.8 |
| Caustic potash (further) required for complete saponification of 5 grammes | 7.36 | 6.52 |

—Pharm. Journ., Jan. 24, 1903, 97.

*Propolis: "Bees-resin"—Chemical Examination.*—Dr. M. Greshoff and J. Sach have submitted propolis, which may reasonably be termed "bees-resin," to chemical analysis. It was found to consist of a mixture of resin and wax in the proportion of 84 per cent. of the former, and 12 per cent. of the latter, and 4 per cent. of an impurity insoluble in alcohol, but solu-

ble in ether. The chief constituent of the wax is cerotinic acid. The formula of the purified resin is $C_{26}H_{26}O_6$, and its melting point 60°, sp. gr., 1.186, acid number, 140. The resin is soluble in ether and chloroform and boiling alcohol, very soluble in acetone, difficultly soluble in carbon bisulphide. The wax has a melting point of 66°, and is soluble in boiling 95 per cent. alcohol, from which it crystallizes on cooling. The cerotinic acid is partly in combination with melissyl alcohol. Previous investigators had noted that propolis had an odor of storax, and had found a substance which was supposed to be gallic acid and a little benzoic acid, and traces of a volatile oil.' But Dr. Greshoff does not record their occurrence, although he notes the balsamic odor when propolis is heated.—Pharm. Journ., Jan. 24, 1903, 90; from Pharm. Weekblad., *47*, 933.

*Honey—Determination of Moisture.*—Frank T. Shutt and A. T. Charron have undertaken a series of investigations to ascertain what difference in composition, if any, existed between honey extracted from capped and uncapped comb. Apiarists term the latter immature or unripe honey, and contend that it is of a thin and inferior quality, and therefore when placed upon the market apt to injure the sale of mature or ripe honey taken from fully capped comb. Further, it is held that "unripe" honey materially affects the latter's keeping quality. Among the first determinations attempted was that of the water-content of the honeys, and the difficulties that were at once met with in obtaining results of a concordant and reliable character led them to examine the various methods now in vogue for estimating moisture in such saccharine substances, these methods being given and explained in detail and the results exhibited in a number of tables as obtained with the different kinds of honey and, in parallel experiments, with solutions of levulose. The results of the work on the latter solutions agreed very well on the whole with those obtained on solutions of honey. It was found that drying the latter from twenty-four to forty-eight hours at 60–70° C. in a partial vacuum on sand gave percentages in close accord with those obtained from the specific gravity determinations. The investigations with levulose solutions prove that a temperature of 60° C., in a partial vaccuum, using sand, furnished figures approximating the amounts weighed out. It is probable that a temperature of 70° C. could be safely used if the pressure were reduced to, say, 6 or 8 inches; but with the partial vacuum that we were able to maintain it is evident that the drying temperature should be as close as possible to 60° C. Initially the author had used asbestos as the absorbent material, but, as stated, the use of sand has been found preferable, the general method being that recommended by Macfarlane for estimating the moisture in milk, butter and other materials that are already fluid or can be readily brought into this condition. The honey was weighed in a weighing bottle and then washed out into a 100 Cc. graduated flask and made up to the containing mark. An aliquot part of the solution was run into each tube containing a suffi-

ciency of asbestos to act as an absorbent. The tubes were then dried in racks in a steam-oven at atmospheric pressure and maintained at the temperatures indicated in the experiments made.—Chem. News, April 24 and May 1, 1903, 195, 196 and 210–212.

*Norwegian Cod-Liver Oil—Constants for a Genuine and Good Product.*—C. Edward Sage says that the scarcity of cod-liver oil has given rise to a considerable amount of substitution on the American market. In consequence, Newfoundland oil is being freely offered in the English market, to replace the Norwegian oil. The latter, however, is inferior in many ways to that from Newfoundland, both in method of preparation and especially in freedom from admixture. Other liver oils have been used to mix with cod-liver oil, but the Newfoundland oil consists largely of menhaden oil and seal oil. It would be difficult to say from analyses that Newfoundland oils are adulterated with the two oils already mentioned, but the following figures show the characters of each of these:

| | Cod-liver Oil. | Menhaden Oil. | Seal Oil. |
|---|---|---|---|
| Specific gravity | 0.923–0.930 | 0.927–0.933 | 0.924–0.926 |
| Saponification number | 179–190 | 192 | 142–152 |
| Free acid (as oleic) | maximum, 1 p. c. | — | 1.8–7.3 |
| Iodine number | 153–170 | 160 | 142–152 |

Other possible adulterants of cod-liver oil are too numerous for detailed mention, but those likely to be used—such as mineral and rosin oil, cotton-seed and other vegetable oils—may be detected by well-known methods. From the results of the author's examination of samples of medicinal Norwegian cod-liver oil during the past few years, he is led to suggest the following requirements for a good oil:

| | |
|---|---|
| Color | Pale yellow. |
| Odor | Characteristic and not fishy. |
| Taste | Bland and not rancid. |
| Sp. gr. at 15.5° C. | 0.923 to 0.930. |
| Saponification-number | 179–190. |
| Fatty acids calculated as oleic | Not more than 1 per cent. |
| Melting-point of fatty acids | 21° to 25° C. |
| Cold test | No solid matter should separate during exposure to a temperature of melting ice for an hour. |
| Iodine-absorption figure | 153–170. |

The author has seldom met with a sample of good medicinal value which has not answered the above requirements, and if in times of scarcity there

may be the temptation to allow a higher acidity figure, it will be well to remember that this factor is one of the first indications of adulteration with other oils, as well as an indication of the presence of an old or rancid oil, which renders cod-liver oil unfit for medicinal purposes.—Chem. & Drugg., April 4, 1903, 571.

*Cod-Liver Oil—Convenient Test of Purity.*—In view of the large increase in the price of cod-liver oil, and the consequent possibility of extensive adulteration and substitution with cheaper oils, Von Wolff calls attention to the availability of the nitric acid test for the commercial determination of its purity. If three (3) drops of pure nitric acid are added to 15 drops of the suspected oil, the latter, if pure, will show a red streak at the point of contact, which rapidly changes to bright red, and, after considerable shaking, to lemon-yellow. Seal oil shows no change at once, but becomes brown on standing; whilst other fish oils give a blue color, changing to brown, and, after prolonged standing, to a yellow color. The iodine and saponification numbers are important factors in a more critical examination of the oil.—Pharm. Ztg., 1903, 235.

*Civet—Composition.*—Alexander Hébert has examined a number of samples of civet from well-known perfume manufacturers. The samples were of a soft consistence, and varied in color from a brownish-yellow to dirty-brown. The melting-point averaged 36°–37°, but was not sharp. The principal matter is soluble in ether, chloroform, benzene, and petroleum ether in the cold, more readily on warming. It is not readily soluble in ethyl or methyl alcohol at the ordinary temperature, but is more soluble on warming. It is insoluble in water, acids or alkalies. The insoluble portion consists of hair, earthy particles, etc. The residue, insoluble in ether and alcohol, amounts to 3.6–5.3 per cent., whilst the ash varies from 0.8–1.2 per cent. Ether-alcohol solutions were examined polarimetrically, but they were found to be practically inactive. On subjecting to steam distillation the excremental odor was removed and the residue had the odor of musk. The matter soluble in ether is difficultly saponifiable with alcoholic potash. The fatty acids obtained are both solid and liquid. The author concludes that there may be considerable variation in samples according to the method of extraction, which is generally effected with instruments smeared with grease or honey. Most samples do not reduce Fehling's Solution more than very slightly, and are optically inactive.—Pharm. Journ., Nov. 15, 1902, 491; from Bull. Soc. Chim. de Paris, *27*, 997.

*Civet—Adulteration with Petroleum Jelly.*—Ernest J. Parry has had occasion to examine a large number of samples of civet during the past year and found the majority of them adulterated, the usual adulterant being petroleum jelly, though very frequently organic matter of vegetable origin is also present in civet. The most trustworthy process for detecting petroleum jelly is that suggested by Dr. Dodge, which consists in extract-

ing the civet with acetone, when the residue will yield the petroleum jelly, if present, to petroleum ether—petroleum jelly being insoluble in acetone. —Chem. and Drugg., Nov. 29, 1902, 901.

*Civet—Examination.*—Ernest J. Parry, referring to the recent examination of civet by Hébert, observes that a residue of only 3 to 5 per cent. from pure civet, on treatment with organic solvents other than alcohol or acetone, agrees with the figures obtained by Braithwaite some years ago, and also with his own examination of samples, on which he can rely. Although no general scheme of analysis is possible, on account of the varied adulterants used, the author believes that the following process will reveal the chief adulterants now being used: The civet (5 Gm.) is mixed with a little kieselguhr, or other suitable diluent, and extracted thoroughly with acetone. The residue is then exhausted with petroleum ether, which will extract any petroleum-jelly present. If the residue be now dried, it will be found to be considerably above the normal 5 per cent. undissolved by organic solvents; for "pure" civet appears at the present time to be the exception rather than the rule. From twenty-two out of thirty-eight samples the author obtained in this way between 18 and 28 per cent. of undissolved residue; but on boiling this with water, a large proportion of the residue is dissolved. The adulterant, whatever it may be, is evidently a carbohydrate, for, while the aqueous solution does not reduce Fehling's Solution, it occasions a copious reduction on inversion with hydrochloric acid.—Chem. and Drugg., May 30, 1903, 871.

# INORGANIC CHEMISTRY.

## General Subjects.

*Saline Compounds—Solubility in Water.*—P. W. Squire and C. M. Caines, referring to the solubilities of saline compounds given in "Squire's Companion," beginning as far back as the edition of 1864 of that work, calls attention to the recent work on the water-solubilities of salts by Greenish and Smith, which compare very closely with those given by the late Peter Squire. This comparison is shown in the following table, which may prove convenient for reference:

| | "Companion." | Greenish and Smith. | Corrections by Greenish and Smith. |
|---|---|---|---|
| Ammonium bromide | 1 in 1.5 | 1 in 1.40 | |
| Ammonium chloride | 1 in 3 | 1 in 2.80 | |
| Potassium bromide | 1 in 1.7 | 1 in 1.59 | |
| Potassium iodide | 1 in 0.75 | 1 in 0.71 | |
| Sodium bromide | 1 in 1.2 | 1 in 1.126 | |
| Sodium iodide | 1 in 0.54 | 1 in 0.58 | |

| | "Companion." | Greenish and Smith. | Corrections by Greenish and Smith. |
|---|---|---|---|
| Sodium chloride | 1 in 2.75 | 1 in 2.8 | |
| Ammonium carbonate | 1 in 4 | 1 in 3.94 | |
| Potassium bicarbonate | 1 in 3.2 | 1 in 3.21 | |
| Sodium bicarbonate | 1 in 12 | 1 in 11.c8 | |
| Potassium carbonate | 1 in 0.75 | 1 in 0.75 | 1 in 0.61 |
| Sodium carbonate | 1 in 1.6 | 1 in 1.66 | |
| Lithium carbonate | 1 in about 70 | 1 in 72.8 | |
| Ammonium phosphate | 1 in 3 | 1 in 0.76 | |
| Sodium phosphate | 1 in 6 | 1 in 6.91 | |
| Potassium nitrate | 1 in 4 | 1 in 3.77 | |
| Potassium permanganate | 1 in 18 | 1 in 18.7 | |
| Sodium arsenate | 1 in 4 | 1 in 4.88 | |
| Sodium hypophosphite | 1 in 1 | 1 in 0.78 | 1 in 0.63 |
| Sodium nitrite | 1 in 1.2 | 1 in 1.36 | |
| Sodium salicylate | 1 in 1 | 1 in 0.88 | 1 in 0.83 |
| Sodium sulphite | 1 in 1.33 | 1 in 1.86 | |
| Sodium sulphocarbolate | 1 in 6 | 1 in 5.84 | |
| Lead acetate | 1 in 2 | 1 in 2.37 | |
| Potassium acetate | 1 in 0.5 | 1 in 0.379 | 1 in 0.279 |
| Potassium chlorate | 1 in 16 | 1 in 16.53 | |
| Potassium bichromate | 1 in 10 | 1 in 9.93 | |
| Ammonium benzoate | 1 in 6 | 1 in 5.1 | |
| Sodium benzoate | 1 in 2 | 1 in 1.68 | 1 in 1.64 |
| Borax | 1 in 25 | 1 in 23.69 | |
| Potassium sulphate | 1 in 10 | 1 in 9.65 | |
| Sodium sulphate (58.5° F. / 59.5° F. / 60.5° F.) | 1 in 3 | 1 in 2.88 / 2.68 / 2.44 | |
| Calcium hydrate | 1 in about 900 | 1 in 780 | |
| Potash, caustic | 1 in 0.5 | 1 in 0.772 | 1 in 0.647 |
| Potassium citrate | 1 in 0.6 | 1 in 0.61 | 1 in 0.55 |
| Potassium tartrate | 1 in 0.6 | 1 in 0.658 | 1 in 0.625 |
| Potassium acid tartrate | 1 in 200 | 1 in 218.6 | |
| Sodium potassium tartrate | 1 in 1.5 | 1 in 1.292 | 1 in 1.138 |
| Acid, arsenous, crystallized | 1 in 100 | 1 in 71 | |
| Acid, boric | 1 in 25 | 1 in 25 | |
| Acid, chromic | 1 in 0.5 | 1 in 0.59 | |
| Acid, citric | 1 in 0.6 | 1 in 0.51 | |
| Acid, tartaric | 1 in 0.8 | 1 in 0.71 | |
| Alum (ammonia) | 1 in 11 | 1 in 9.95 | |
| Alum (potash) | 1 in 11 | 1 in 9.70 | |
| Calcium chloride, $CaCl_2 + 2H_2O$ | 1 in 1 | 1 in 0.82 | |
| Copper sulphate | 1 in 3.5 | 1 in 2.79 | |
| Lithium citrate | 1 in 2 | 1 in 1.635 | |
| Magnesium sulphate | 1 in 1.3 | 1 in 0.98 | |
| Zinc acetate | 1 in 2.5 | 1 in 2.11 | |
| Zinc chloride | 1 in 0.4 | 1 in 0.344 | |
| Zinc sulphate | 1 in 0.7 | 1 in 0.65 | |
| Zinc sulphocarbolate | 1 in 2 | 1 in 2.7 | |



—Chem. and Drug., Dec. 6, 1902, 945.

*Decinormal and Centinormal Solutions—Limits of their Reliability.*—R. C. Cowley and J. P. Catford show that the error in working with decinormal and centinormal volumetric solutions may amount to a difference of 3 per cent. on the quantity of alkaloid if the solutions are measured with a burette. This they determined by weighing 10-Cc. and 4-Cc. quantities of soda and acid solutions, when lower amounts were invariably obtained, although allowance appears not to have been made for sp. gr. of the solutions.—Trans. Brit. Pharm. Conf. 1902, 493-495.

*Roentgen Rays—Effect and Prevention of Burns.*—Dr. E. A. Codman, in the "Philadelphia Medical Review," discusses the burns caused by exposure to Roentgen rays. Nearly two hundred cases are cited, and this large number should silence any doubts as to the reality of the danger. The cause of the Roentgen ray burns is not known, but the primary injury is sustained by the nerves controlling the nutrition of the skin, and there is no reliable evidence to show that injury has ever occurred in deeper tissues without primary interference with the skin. The appearance of the burn is similar to that of sunburn, giving rise in more severe cases to blistering and ulceration. It differs, however, from sunburn in the fact that the body is transparent to Roentgen rays, with a consequent result that the injury extends to the deeper layers of the skin and subcutaneous tissues, even involving tendon sheaths and joints. A very curious feature of these burns is the fact that while in some instances the injury appeared immediately, in most cases a period of ten days elapsed before the burn was noticed, and in a few cases the burn was not developed until after a delay of months. Some people seem predisposed to the malady, while others are not affected in any way by exposure to the rays, and there seems to be no way of predetermining who will be susceptible to these burns. The injury can be avoided in two ways. A thin grounded sheet of aluminum may be interposed between the patient and the source of the rays. Codman, however, favors the second method, namely, limiting the time of exposure to a period of safety.—Pharm. Rev., Sept., 1902, 413; from Sc. Amer., *86*, 342.

*The X-Rays—Therapeutic Application.*—M. I. Wilbert observes that the marvelous cures that are being reported in the daily press as having been accomplished by means of the X-rays are rather misleading, in that they have a tendency to make people believe that treatment by means of the X-rays was not alone well established, but that in many if not all cases of pathological new growths or ulcerations this method of treatment would dispense entirely with the use of the surgeon's knife. Moreover, these reports are likely to cause a considerable amount of harm by inducing individuals to refuse to submit to a surgical operation at a time when such a procedure would involve little or no risk to life, and would appear to offer some chance of bringing about a permanent cure. Mr. Wilbert is of the opinion that the pharmacist, who is so frequently consulted and asked for

advice, can and should contribute his share to a proper elucidation of the facts, and he should be able to speak intelligently on the subject of the therapeutic application of the X-rays, so that he may exert sufficient influence, when warranted, to induce a patient to submit to the advice or direction of the family physician. While the exact mode of the therapeutic action of the X-rays has, even at the present time, not been definitely determined, a considerable amount of reliable data has been collected as to the effects that the X-rays have on different conditions under varying circumstances. So far, most promising and satisfactory results have been obtained in cases of superficial new growths, like the epidermal cancers and epitheliomata. They have been used with advantage as a cosmetic agent to remove superfluous hair, and favorable results have been obtained in cases of psoriasis, eczema and acne. In addition to the curative action, the X-rays also have a marked analgesic and anodyne effect.—Amer. Jour. Pharm., Dec., 1902, 579–583.

NEW ELEMENTS.

*Radium—Atomic Weight.*—By concentrating by fractional crystallization the greater part of the radiiferous barium at her disposal, Madame Curie succeeded in obtaining about 1 decigram of perfectly pure radium chloride. This, by the method explained in detail, enabled her to determine the atomic weight of radium, which is 225—taking Cl=35.4 and Ag=107.8—with a probable uncertainty of not more than one unit, radium being considered a bivalent element. From its chemical properties radium is an element of the alkaline-earthy series, and in this series it is the higher homologue of barium. According to its atomic weight it should be placed in Mendleeff's table below barium in the alkaline-earthy series, and on the line with thorium and uranium.—Chem. News, Aug. 8, 1902, 61; from Compt. rend., *135*, 161.

*Radium—Heat Evolved by Its Salts.*—Calling attention to the fact that they have already proved that radium salts give out heat continuously, P. Curie and A. Laborde communicate the results of further researches undertaken with the object of determining the amount of heat evolved. They state now that one Gm. of radium evolves in one hour a quantity of heat which is of the order of 100 small calories per hour, and that one Gm. atom of radium (225 Gm.) evolves during one hour 22,500 calories, a number comparable with that of the heat evolved by the combustion of one Gm. atom of hydrogen. The heat evolved by radium was ascertained by direct measurement with the Bunsen calorimeter. The continuous evolution of such a quantity of heat cannot be explained by ordinary chemical transformation. If we look for the origin of the heat in an internal transformation, this transformation must be of a very profound nature, and must be due to a modification of the atom of radium itself. However, such a transformation, if it exists, takes place with extreme slowness. In-

deed, the properties of radium show no variation after several years, and Demarçay observed no difference in the spectrum of the same specimen of radium chloride during experiments made at intervals of five months. If, therefore, the above hypothesis is correct, the energy brought into play during the transformation of the atoms must be extraordinarily great. The hypothesis of a continuous modification of the atom is not the only one compatible with the evolution of heat by radium. This evolution can also be explained by supposing that radium is capable of utilizing an external energy of unknown nature.—Chem. News, April 3, 1903, 159; from Compt. rend., 136, 673.

In this connection, a letter from Sir Wm. Crookes, which appeared in *The Times* of March 26, 1903, and entitled

*The Mystery of Radium*, is highly interesting. He observes that although the fact of emission of heat by radium is in itself sufficiently remarkable, this heat is probably only a small portion of the energy radium is constantly sending into space. It is at the same time hurling off material particles which reveal their impact on a screen by luminous scintillations. Stop these by a glass or mica screen and torrents of Röntgen rays still pour out from a few milligrams of radium salt, in quantity to exhibit to a company all the phenomena of Röntgen rays, and with energy enough to produce a nasty blister on the flesh, if kept near it for an hour.—Chem. News, April 3, 1903, 158.

*Radium—Intensity of the Light Produced by its Compounds.*—Giesel, at a meeting of the French Academy of Medicine, stated that compounds of radium produce a perception of light in the eye, even when a screen is interposed between the eye and the radium compound. The screen may be of metal, and the whole of the visual field appears full of light. The same sensation of light is felt if a glass tube containing a few centigrammes of radium chloride be pressed against the temple.—Drug. Circ., Aug., 1902, 164.

*Radium—Properties of the Emanations from it.*—Sir William Crookes states that the emanations from radium are of three kinds. One set is the same as the cathode stream, now identified with free electrons—atoms of electricity projected into space apart from gross matter—identical with "matter in the fourth or ultra-gaseous state," Kelvin's "satellites," Thomson's "corpuscles" or "particles;" disembodied ionic charges, retaining individuality and identity. Another set of emanations from radium are not affected by an ordinarily powerful magnetic field, and are incapable of passing through very thin material obstructions. They have about one thousand times the energy of that radiated by the deflectable emanations. They render air a conductor and act strongly on a photographic plate. These are the positively electrified atoms. Their mass is enormous in comparison with that of the electrons. A third kind of emanation is also

produced by radium. Besides the highly-penetrating rays which are deflected by a magnet, there are other very penetrating rays which are not at all affected by magnetism. These always accompany the other emanations, and are Röntgen rays—ether vibrations—produced as secondary phenomena by the sudden arrest of velocity of the electrons by solid matter, producing a series of Stokesian "pulses" or explosive ether-waves shot into space. These rays chiefly affect a barium platinocyanide screen, and only in a much feebler degree zinc sulphide. The action of these emanations on phosphorescent screens is different. The deflectable emanations affect a screen of barium platinocyanide strongly, but one of Sidot's zinc sulphide only slightly. On the other hand, the heavy, massive, non-deflectable positive atoms affect the zinc sulphide screen strongly, and the barium platinocyanide screen in a much less degree.—Chem. News, May 22, 1903, 241.

*Radium, Polonium and Actinium—Comparative Radio-Activity, etc.*— In an appendix to a paper read before the American Institute of Electrical Engineers, in which the historical facts connected with radio-active substances discovered since Becquerel first directed attention to the remarkable uranium radiations, Wm. J. Hammer communicates some notes by Professor Curie on the character and relative activity of radium, polonium and actinium, in which he states: (1) It is well known to-day that radium is a new element characterized by a special spectrum. Radium has an atomic weight equal to 225. (2) Radium, actinium and polonium possess an activity which is a million times that of uranium. (3) Radium emits exactly the same quantity of Becquerel rays when it is in the liquid air, as it does at the normal temperature of the atmosphere. The luminosity of the chloride of radium is stronger in the liquid air than in the atmosphere at a normal temperature. (4) The spectrum of radium has been fully studied by Demarçay and the rays that he points out certainly belong to him.—Chem. News, Jan. 16, 1903, 25–27.

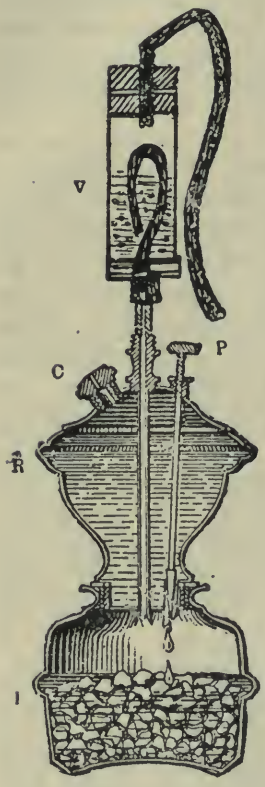
*Polonium—Method of Isolation.*—Dr. H. Markwald has succeeded in isolating a minute quantity of polonium, the radio-active constituent of bismuth, in a manner which would appear to exclude the possibility of the identity with bismuth. Starting with some kilogrammes of residues from pitch-blende, about 1 per cent. of strongly radio-active bismuth oxychloride was obtained, and it was proved that this activity remained unchanged after several months. The acid solution of the compound was then treated with a stick of pure metallic bismuth, which became coated, after some time, with a black deposit. It was found that the activity of this deposit, as measured by the electroscope, far exceeded that of the original solution, the residual solution having lost the activity during the deposition. No deposit was observed when a second stick of bismuth was placed in this exhausted solution. The total weight of polonium obtained was only 5

milligrammes, corresponding to an amount not exceeding 1 gramme per ton of pitch-blende. The author hopes to be able to obtain sufficient material to carry out an atomic-weight determination.—Pharm. Journ., Aug. 2, 1902, 86; from Berichte, through Nature, *66*, 281.

OXYGEN.

*Pure Oxygen—Preparation from Alkaline Peroxides.*—According to Joubert, oxygen may be prepared similarly to acetylene from calcium carbide, by allowing water to act upon cubes or lumps of peroxide of sodium or potassium. An addition of the theoretical quantity of potassium permanganate or of a trace of a nickel or copper salt is necessary, since the hydrated salt produced by the reaction with water is stable in the cold, but with the additions mentioned, pure oxygen is evolved.—Apoth. Ztg., 1902, 810; from Compt. rend., *134*, 778.

FIG. 54.




Oxygenophor.

*Oxygen—Apparatus for Preparing It from Sodium Peroxide.*—Sabatier has now constructed the apparatus shown by Fig. 54, which he has named "Oxygenophor," for preparing oxygen from sodium peroxide. The reservoir *R* is charged with water, which is allowed to flow at the rate of a drop per second into the container *I*, charged with about eight tablets. The oxygen generated, 30 liters in one-half hour, passes through the water in *V*. In addition to water, this can be charged with medicaments, *e. g.*, cotton saturated with turpentine oil, etc. The apparatus is designed especially for patients undergoing treatment in oxygen therapy.—Pharm. Rev., Feb., 1903, 75; from Pharm. Post, *35*, 677.

*Ozone—Reaction with Ursol-D.*—Arnold and Mentzel find that the substance, ursol-D., recommended by Chlopin as a reagent for ozone is not trustworthy, the reaction only occurring in presence of acid. With acid-free ozone only a very faint blue color is produced, instead of a violet or dark blue.—Pharm. Zeit., 1902, 979; from Ber. d. Deutsch. Chem. Ges., 1902, 531.

HYDROGEN.

*Hydrogen—Metallic Nature.*—One of the most remarkable facts in chemistry is the two-fold nature of hydrogen. On the one hand, it be-

haves precisely as a metal in a vast number of its chemical relations, and on the other hand, it exhibits equally decided non-metallic characteristics. Geoffrey Martin recounts the following extremely striking properties that appear to show that hydrogen in its chemical relations presents all the characteristics of a metal: 1. It generates a whole series of salts—the so-called acids—which are perfectly analogous to the corresponding compounds of Na and K, except in so far as they are stamped with the peculiarities of hydrogen itself. 2. When hydrogen enters into the structure of a compound it exercises the same effect on its properties as a light metal, such as Na or K, making in general an acid compound less acid, and a basic compound more basic. 3. When the elements are arranged in the order of their affinity for positive electricity, hydrogen actually occurs among the metals, between lead and tin. 4. Moreover, the thermal effects produced by the combination of hydrogen with equivalent quantities of the successive elements, P, C, S, N, O, are in the same order as those produced by the combination of Na with the same substances. 5. In addition, Pd is able to absorb several hundred times its volume of hydrogen gas and still retain its lustre and general metallic appearance, as would be the case if the compound is a Pd-H alloy.—Chem. News, Feb. 13, 1903, 74.

*Hydrogen Peroxide—Production in Crystalline Form.*—W. Staedel gives some preliminary particulars concerning the production and properties of crystalline hydrogen peroxide. Using the strongest available solution of hydrogen peroxide, this was cooled by means of a mixture of ether and carbon dioxide. A small portion of solidified product was then obtained, which was added to another portion of solution of hydrogen peroxide cooled to —8° to —10° C., resulting in the formation of an abundant crop of clear columnar crystals. These were drained from the mother liquor, allowed to melt, and then cooled and solidified as before. The product proved to be pure hydrogen peroxide, which was found to be an extraordinarily active body, being decomposed with explosive violence on addition of a trace of platinum black or manganese dioxide, while carbon, magnesium powder, wool and damp sponge were immediately ignited by it.—Pharm. Centralh., 1902, 546; from Ztschr. f. Angur. Chem., 1902, 642.

*Hydrogen Dioxide—New Process of Preparing Solution.*—According to Paul Leon Horlin, solution of hydrogen dioxide may be prepared by adding, with caution and at a low temperature, sodium dioxide to a solution of fluoric acid (which results in the production of hydrogen dioxide and sodium fluoride), then treating the solution with aluminum fluoride, thus producing insoluble cryolite, the well known double fluoride of aluminum and sodium.—Amer. Journ. Pharm., March, 1903, 141; from Ztsch. f. Angur. Chem., 1902, 600.

*Hydrogen—Significance of its Presence and Quantity in Air.*—Armand Gautier observes that the presence of free hydrogen in the atmosphere is important from the point of view of the origin of the air, its constitution, the constitution of the upper layers of the atmosphere, and the part which this gas takes in meteoric and chemical phenomena. It is certain that the composition of the air is slightly variable, and the weight of unit volume is not the same in the country, in populous towns, over the sea, and in the higher regions of the atmosphere.—Chem. News, Jan. 2, 1903, 11; from Compt. rend., *135*, No. 23 (Dec. 8, 1902).

*Hydrogen Dioxide—Use as a Depilatory.*—L. Gallois finds that the application of solution of hydrogen dioxide serves as a simple and efficient way of removing superfluous hair; absorbent cotton, moistened with the solution, being repeatedly applied to the region to be depilated. The hair at first becomes bleached, finally becomes brittle and breaks off. The simplicity of this treatment, and its comparative harmlessness, would appear to warrant a trial.—Amer. Journ. Pharm., March, 1903, 141; from Med. Presse, 1902, 438.

*Hydrogen Peroxide—Medicinal Exhibition and Uses.*—N. Novikow prescribes hydrogen dioxide for a variety of purposes in the following forms: For infectious diarrhœa of adults, certain pulmonary affections, and as a palliative in cancer of the digestive organs, the following mixture is given: Hydrogen peroxide, 6; water, 85; simple syrup, 15. A dessertspoonful every two hours. For infantile cholera and diphtheria the same mixture may be given in teaspoonful doses. For a gargle an ounce of hydrogen peroxide in a tumblerful of water may be employed. In diphtheria, the throat may be painted twice or thrice daily with undiluted hydrogen peroxide. For eczema and other skin affections the following ointment may be prescribed: Hydrogen peroxide, 10 to 15; anhydrous wool-fat, 1,000. Hydrogen peroxide may also be used, either pure or diluted, as an irrigation or dressing for wounds, or as an application in skin diseases. Stomatitis, of various origin, and particularly mercurial stomatitis, is rapidly cured with a gargle or mouth wash of two or three tablespoonfuls of hydrogen peroxide to a tumblerful of water. Only "10 to 12 volume" hydrogen peroxide should be used in these formulæ.—Pharm. Journ., Nov. 1, 1902, 435; from L'Union Pharm., *43*, 409.

## HALOGENS.

*Chlorine—Preparation by the Aid of Permanganates.*—C. Graebe has experimented on the preparation of chlorine by the aid of potassium and calcium permanganates, and finds that when it is required to prepare small quantities of chlorine, the use of permanganate is very convenient, especially in cases where the presence of peroxide of chlorine would be objectionable; for its preparation on a large scale, the sodium chlorate method

is preferable when the presence of the peroxide is not of importance. To prepare chlorine by means of permanganate, the same apparatus is used as with the chlorate of sodium method; solid permanganate is placed in a flask, and concentrated hydrochloric acid is dropped on to the salt very gradually. The operation is commenced in the cold, then heat is applied when half the necessary amount of hydrochloric acid has been added. To get off all the chlorine, it is necessary to use an excess of hydrochloric acid, and experience shows that about ten molecules of acid are necessary for each one of permanganate, instead of the eight required theoretically. When the operation is properly carried out, almost the theoretical amount of chlorine is obtained.—Chem. News, Jan. 23, 1903, 48; from Berichte, *35*, 13.

*Chlorine—Union with Hydrogen.*—Dr. J. W. Mellor points out that there is no experimental evidence to show that chlorine gas under the influence of light undergoes any change capable of appreciably affecting the chemical activity of that element towards hydrogen. Part of the energy absorbed by moist chlorine from sunlight is dissipated as heat and causes the Budde effect. Under the influence of light, chlorine sets up and maintains in a state of equilibrium a reversible reaction with water vapor, possibly $2H_2O + 2Cl_2 = 4HCl + O_2$. Dry chlorine does not exhibit the Budde effect. The rise in temperature of imperfectly dried chlorine when exposed to sunlight appears to be due to some chemical reaction between the moisture and the chlorine gas. A layer of moist chlorine just thick enough to screen a bulb of mixed hydrogen and chlorine gases from chemical action is not sufficient to prevent chemical action if the chlorine is dried by means of purified phosphorus pentoxide. The actinic energy continuously absorbed from sunlight by moist chlorine is dissipated in at least three ways: (1) In maintaining the above chemical reaction; (2) by conversion into heat during molecular impacts; (3) as external non-actinic radiations from the molecules moving in their free path between molecular collisions. In a further paper it is stated that if the reaction between hydrogen and chlorine in the presence of moisture is assumed to take place with the formation of an intermediate compound, the period of induction is a direct consequence of the law of mass action. Since neither chlorine monoxide nor hydrogen hypochlorite abbreviates the period of induction, neither of those substances can take part as an intermediate compound in the reaction between hydrogen and chlorine. Further, since chlorine acquires no appreciable chemical activity by exposure to sunlight, the presence of hydrogen, as well as of moisture, determines the greater chemical activity of an induced mixture of hydrogen and chlorine gases. If an intermediate compound takes part in the reaction between hydrogen and chlorine in the presence of moisture, the most probable "compound" satisfying the required conditions contains $x(Cl_2)$, $y(H_2O)$, $z(H_2)$, where $x$, $y$, $z$ are positive integers.—Pharm. Journ., July 5, 1902, 2; from Proc. Chem. Soc., *18*, 169.

*Calcium Chloride—Haemostatic Value.*—Bertignon emphasizes the fact that calcium chloride is a haemostatic of the greatest value, succeeding where ferric chloride, antipyrine, ergotin and other drugs have failed. It is indicated in hæmorrhages of all kinds, and in all maladies presenting hæmorrhagic complications. Hæmatemesis, hæmaturia, enterrhagia and metorrhagia are all rapidly arrested by $CaCl_2$. A case was cited of the cure, by its means, of acute general purpura, in which other remedies had failed. The author prescribes it as follows: Pure crystalline calcium chloride, 60 grains; syrup of opium (Codex), 3 drachms; water, 4 ounces. To be taken (at intervals) in twenty-four hours, and renewed as long as the hæmorrhage lasts.—Pharm. Journ., April 11, 1903, 525; from Med. Press, *74*, 575.

*Bleaching Powder—Formation and Composition.*—The difficulties experienced in making good bleaching powder from "electrolytic chlorine," owing to the gas containing considerable quantities of carbon dioxide, induced Winteler to undertake a series of investigations, which have led to the following conclusions: Dry chlorine does not act on dry calcium hydroxide, but in the presence of moisture chlorine water is first formed. This contains hypochlorous and hydrochloric acids, which then act upon the calcium hydroxide. The action involves complicated equilibria, which depend on the temperature, the amount of water present, the rate at which the chlorine is passed, etc. Bleaching powder possesses no definite formula, but is a mixture of bodies resulting from the balanced reactions just referred to. It contains basic calcium chloride and basic hypochlorite as normal components, and may contain chloride and hypochlorite as well as hydroxide and the free acids. The decomposition of bleaching powder into chloride and oxygen takes place when there is an excess of hydroxyl ions; on the other hand, an excess of hydrogen ions leads to a decomposition into chlorate and chloride. Working upon this theory of the character of bleaching powder, it is possible to prepare a good product even when using unpurified chlorine containing 6 per cent. of carbon dioxide. Pharm. Journ., Jan. 21, 1903, 126; from Zeits. anorgan. Chemie, through Nature, *67*, 233.

*Chlorinated Lime—Assay of Commercial Samples.*—Out of eighteen samples of chlorinated lime examined by A. G. Lyon, only one corresponded to the U. S. P. standard of available chlorine, containing 35.4 per cent.; another, approximated with 33 per cent.; two contained 20 and 21.2 per cent. respectively; three from 9.8 to 13.5 per cent.; five from 4.5 to 8.0 per cent.; and the others contained from 0.4 to 2.5 per cent. The first four are bulk samples. All the others were in cases under different brands.—Proc. Mich. State Pharm. Assoc., 1902, 55.

*Chlorides and Bromides—A New Distinctive Test.*—Georges Viard finds that an excess of concentrated sulphuric acid gives a yellowish-brown pre-

cipitate of anhydrous chloride when added to a solution of cupric chloride, and a black precipitate of the anhydrous bromide when added to cupric bromide. The same precipitates are produced by adding an excess of sulphuric acid to any cupric salt in presence of an alkaline chloride or bromide. This property gives a convenient distinction between chlorides and bromides, the best application being to prepare beforehand a mixture of 1 volume of copper sulphate with 10 volumes of $H_2SO_4$. By adding to this reagent a few drops of the salt to be examined, a yellow precipitate is formed if a chloride is present, a black precipitate if it is a bromide. Very dilute solutions may thus easily be recognized.—Chem. News, Aug. 22, 1902, 95; from Compt. rend., *135*, No. 3, (July 21, 1902).

*Chlorides and Bromides of Cadmium, Mercury and Tin.—Precipitation by Sulphuric Acid.*—Georges Viard also finds that an excess of concentrated sulphuric acid precipitates the chlorides of cadmium, mercury and tin from their solutions. These salts can be recognized by producing white precipitates with a large excess of concentrated sulphuric acid instead of the yellow or black precipitates produced under the conditions of the above-mentioned test by the chlorides and bromides of copper respectively.—Chem. News, Sept. 12, 1902, 138; from Compt. rend., *135*, No. 4 (July 28, 1902).

*Bromides—Estimation in Presence of Chlorides and Iodides.*—Acid chlorine water transforms iodides into iodates and displaces the bromine from bromides, no matter what excess of chlorine is used. In alkaline solution the bromides are transformed into bromates by an excess of chlorine water. On these facts von Weszelszky has based the following method of estimation: If the substance does not contain iodine, about 1 Gm. of carbonate of potassium and the corresponding quantity of chlorine water are added to the solution; it is then evaporated to dryness. The residue, dissolved in 100–150 Cc. of water, is acidulated and titrated by hyposulphite of soda after the addition of a little iodide of potassium. If the solution contains both bromine and iodine it is placed in a retort, acidulated, and after adding chlorine water in sufficient quantity to oxidize the iodides to iodates and displace the bromine from the bromides, it is distilled in a current of carbonic acid. The bromine and the excess of chlorine are collected in an aqueous solution of 1 Gm. of potash; after the potash is completely saturated by the carbonic acid it is evaporated to dryness, and taken up with water and iodide of potassium to titrate, by means of hyposulphite, the iodine displaced by the bromate. Chlorates in small quantities have no action on the iodide of potassium, but iron, arsenic, and antimony ought first to be eliminated in the ordinary way.—Chem. News, Aug. 15, 1902, 84; from Ztschr. Anal. Chem., *39*, 81.

*Iodine—Atomic Weight.*—The question as to whether tellurium or iodine

possesses the larger atomic weight has given rise to many researches, the work having hitherto been principally devoted to tellurium, partly because, as the rarer and lesser known element, tellurium might possibly contain elements of higher atomic weight, but chiefly because the work of Stas in regard to iodine appeared so convincing that further determinations of this constant for iodine would be superfluous. Since, however, all the work done on tellurium tends to show that its atomic weight is decidedly higher than that of iodine, Prof. Ladenburg has now attacked the question from the other side, and has re-determined the atomic weight of iodine, using methods of purification differing from those adopted by Stas. The result is stated to be in almost absolute agreement with the usually accepted figure, so that the discrepancy between the conclusions of the periodic law and the results of experiment still remain unexplained.—Pharm. Journ., Aug. 2, 1902, 85; from Nature.

*Iodic Acid—Faulty Methods of Preparation.*—Ernest Boyle has endeavored to prepare iodic acid by the process recommended in all available text-books, in conformity with which 20 grains of iodine were warmed in a flask with 100 grains of pure fuming $HNO_3$, sp. gr. 1.5. After eight hours' contact little or no action had apparently taken place, and the mixture was then gently heated, the flask having a long upright tube attached to prevent loss of iodine. The heat was maintained for four hours, loss of $HNO_3$ being supplied during the operation, and the result was the same as before. The contents were then allowed to stand in a warm fume chamber, without the application of heat, for four weeks, no satisfactory result being visible. It would seem that there is required a suggestion for a better process, such as could be performed in an ordinary pharmaceutical laboratory.—Pharm. Journ., May 2, 1903, 619.

Referring to Mr. Boyle's difficulty to obtain iodic acid, John Lothian states that small quantities may be prepared fairly quickly by boiling gently 1 part of very finely powdered iodine with 5 to 8 parts of fuming nitric acid in a flask with a long neck, on a sand-bath, and passing through the boiling liquid, by means of a gas-holder or foot-blower, a gentle current of air to drive off the oxides of nitrogen produced, which have a reducing action on the iodic acid. Unless this is done, a condition of chemical equilibrium results, and the reaction becomes stationary, as much iodic acid being reduced as there is iodine oxidized; this seems to have been Mr. Boyle's experience.—Pharm. Journ., May 9, 1903, 652.

*Alkaline Periodates—Convenient Method of Preparation.*—P. Roques and A. Gerngross obtain alkaline periodides very readily by treating the iodides in alkaline solutions with a large excess of an alkaline hypochlorite. The method is more convenient than that usually followed, which entails first the preparation of an iodate and then the employment of chlorine gas. The yield of periodide is practically theoretical. KI, 50, and NaOH,

20, are dissolved in water, and treated with a large excess of solution of sodium hypochlorite. The mixture is kept for some time on the water-bath; it soon becomes cloudy, and a crystalline deposit of sodium para-periodide, $Na_2H_3IO_6$, is formed, which is collected.—Pharm. Journ., Aug. 23, 1902, 211; from Journ. Pharm. Chim., [6], *16*, 120.

*Pure Iodine Pentafluoride—Preparation and Characters.*—H. Moissan has succeeded in preparing pure iodine pentafluoride, hitherto not obtainable in a pure state, as follows: Pure fluorine, free from hydrofluoric acid, is allowed to act on iodine, in a glass tube, surrounded by a coil of lead condenser tubing through which a current of cold water is allowed to flow. The apparatus is connected with a U-tube receiver, in which the volatilized $IF_5$ condenses as a colorless liquid which solidifies at + 8° C., forming a camphor-like mass; it boils at about 97° C., distilling without decomposition. Its vapor decomposes at between 400° and 500° C., liberating iodine. On contact with air, it gives off copious fumes, which are very irritating to the respiratory organs. It may be distilled unchanged in a current of hydrogen. Chlorine and bromine are without action on it in the cold, but on heating combination takes place. Oxygen does not combine with it at 100° C. Sulphur when gently heated forms gaseous sulphur hexafluoride, sulphur iodide and a little free sulphur. Phosphorus combines energetically with the fluorine forming phosphorus pentafluoride; arsenic and antimony behave in a similar manner, forming metalloid fluorides and liberating iodine. Carbon attacks it in the cold, forming carbon tetrafluoride. Boron at once takes fire in $IF_5$, forming boron fluoride and liberating iodine. Silicon is without action in the cold, but when heated, violent reaction occurs. The alkali metals react energetically on $IF_5$, but silver is not attacked at 100°. Pure $IF_5$ does not react with violence with water, as stated by MacIvor; on the contrary, a slight rise of temperature alone takes place, although the compound is completely decomposed into hydrofluoric and iodic acid, according to the equation: $2HF_5 + 5H_2O = I_2O_5 + 10HF$.—Pharm. Journ., Nov. 22, 1902, 523; from Comptes rend., *135*, 563.

*Liquid and Solid Fluorine—Properties and Reactions.*—In the course of investigations on the influence of low temperatures on chemical affinity, H. Moissan and J. Dewar have obtained some interesting and curious results with liquid fluorine at −187° C. With many substances violent combination is found to take place at this low temperature. Two difficulties had to be overcome in the course of the experiments, the great hygroscopic energy of bodies cooled to −100° C., by which they are often enveloped in a solid layer of ice; and the fact that when combination takes place it is sometimes only superficial, forming an envelope of insoluble matter which prevents further action. The fluorine employed was absolutely dry and free from HF, and was contained in a quartz tube of larger diameter than the sealed glass containing the matter, absolutely dry, to be

added to it; this substance was cooled previous to use by immersing the tube in liquid air. By breaking off the sealed end and raising the tube, a little of the contents could then be allowed to fall into the liquid fluorine maintained at −187° C. Under these conditions iodine is without action, although it takes fire in gaseous fluorine at ordinary temperatures. Liquid oxygen also has no action, and when mixed and allowed to boil, the two component liquids volatilize at their respective boiling points. Sulphur burns at once in liquid fluorine with an intense blue flame, the sides of the apparatus being covered with crystals of sulphur hexafluoride, which quickly volatilize. Selenium combines with even greater explosive violence, but tellurium is without action; so is nitrogen. Amorphous phosphorus combines with liquid fluorine with incandescence, forming phosphorus pentafluoride. Arsenic unites with great violence, and the product is a fine blue flame: while antimony is not even deprived of its metallic lustre by immersion in liquid fluorine. Carbon, silicon, and boron are without action on the liquid, but particles of charcoal or lamp-black take fire in the gaseous fluorine in the upper portion of the tube, being extinguished as soon as they fall into the liquid. Sodium remains bright, but is coated superficially with a transparent layer of sodium fluoride. Potassium does not react at first, but after about twenty seconds combination takes place with a violent explosion. Arsenious anhydride, silica, and boric anhydride are inert towards liquid fluorine, but lime reacts with explosive violence and incandescence. Anthracene also causes an explosion, but iodoform is not affected; nor is sugar, mannite, or morphine. The authors have also obtained fluorine in the solid state. Having found that the element, when quite free from hydrofluoric acid, is without action on glass, it was possible in the experiments to enclose fluorine in a glass vessel with thin walls and to expose it to the cooling influence of liquid hydrogen. When a sealed tube of fluorine was immersed in boiling liquid oxygen no trace of condensation took place. With liquid hydrogen, however, on gradually lowering the tube into the vapor condensation slowly took place, a yellow liquid being formed, which resumed its gaseous form on being raised out of the vapor of the boiling hydrogen. On again cooling the tube in the vapor and finally plunging it in the liquid hydrogen, the yellow fluid fluorine gradually solidified. When the tube containing the yellow solid was left for some time in the liquid hydrogen, until the temperature was only 20.5° above absolute zero, the solid yellow fluorine became white. In this respect fluorine resembles chlorine, bromine, and sulphur, which also become colorless at an extremely low temperature. The temperature at which fluorine solidifies is about 40° absolute or −233° C. Although physicists have thought that at absolute zero all matter may be inert and no chemical action may take place, this is proved to be far from being so with solid fluorine and liquid hydrogen. It was found that at a temperature only 20.5° above absolute zero, −252.5° C., a

small fragment of fluorine brought into contact with liquid hydrogen, combined with such violence as to shatter the containing tube, and, becoming incandescent with the heat evolved to set fire to the hydrogen.—Pharm. Journ., May 19, 1903, 642; from Comptes rend., *136*, 641 and 785.

*Fluorides—Detection in Butter.*—Otto and Charles W. Hehner draw attention to the use of fluorides as preservatives for butter and milk, a practice which they show to be attended with danger to the consumer. Hitherto the use of these preservatives has been chiefly confined to French producers. The fluoride is not easily detected, especially in the presence of boric acid. They recommend the following method: The aqueous liquor is separated from 50 grammes of butter, by melting, and without clarifying, calcium chloride is added, the liquid heated to boiling, and a small excess of sodium carbonate added to precipitate the calcium compounds. The precipitate, which consists of carbonate, borate, fluoride, with some phosphate and perhaps sulphate, is filtered off, burnt and treated with hot acetic acid: this dissolves out carbonate, borate and phosphate. The residue is again collected on a filter, ignited and treated with strong sulphuric acid, the crucible being covered with a waxed glass slip in the usual way. Distinct etching of the glass results in the presence of fluoride. Experiments with ptyalin, pepsin, etc., show that fluorides have a marked inhibitory action on the digestive processes.—Pharm. Journ., July 26, 1902, 83; from Analyst, *27*, 173.

## SULPHUR.

*Amorphous Sulphur—Nature.*—Alexander Smith and W. B. Holmes discuss the nature of amorphous sulphur. This so-called amorphous sulphur is formed when liquid sulphur is maintained in the molten condition for some time, and its amount increases as the temperature is raised. A method of determining the proportion of amorphous sulphur in the liquid variety has been worked out which depends essentially on the great difference in solubility of the two forms in carbon bisulphide. From parallel determinations of the proportion of amorphous sulphur and of the freezing point of the melt, it is shown that the lowering of the freezing point below 119.25° C. is proportional to the quantity of the dissolved amorphous sulphur. The molecule of the latter in the solution of the soluble liquid form is found to be represented by the formula $S_8$.—Pharm. Journ., Feb. 28, 1903, 265; from Zeits. für Phys. Chem., through Nature, *67*, 352.

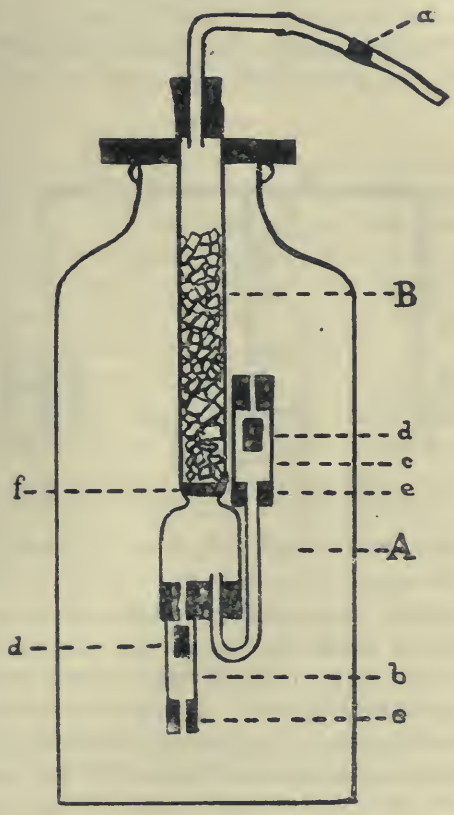
*Sulphur—Blue or Green Modifications.*—In a previous paper N. A. Orlaf has described the formation of blue or green sulphur by the action of $S_2Cl_2$ on certain metallic sulphides in the presence of organic solvents, this coloration being, however, not due to organic substance in admixture. The author describes various reactions which give rise to the formation of green or blue sulphur; the conclusions to be drawn from his experiments may be summarized as follows: 1. A large number of facts tend to prove

that a blue or green (caused by mixing with the yellow sulphur) modification of sulphur does exist, but it is very unstable, and can only exist under certain special conditions, such as fixation on the metallic chlorides at the moment of its separation from certain compounds, the presence of certain mineral or organic compounds. 2. Among the conditions favorable to the formation of blue sulphur we must note particularly the phenomenon of apparent dissociation and the reactions which remain incomplete; the reaction of Caraves Gil, which consists of pouring a few drops of a solution of a polysulphide of Na, K, $NH_4$ or Ca into concentrated boiling alcohol; a blue or bluish-green coloration is formed, which disappears on the addition of an alkali or of any other substance capable of decomposing the polysulphide; the alcohol may be replaced by acetone. 3. The structure of blue sulphur is uncertain, but in any case the reaction of CdS on $S_2Cl_2$, the experiments of Geutner, and even the color of the product, would point to a structure similar to that of ozone ($S_3$). The preparation of blue sulphur in a pure state offers difficulties as great as the preparation of pure ozone. Although the blue sulphur may be very unstable in the free state, it may form a very stable chromophore group when fixed with certain substances. The author thinks that we might look upon sulphur as the chromophore of certain mineral colors, particularly of ultramarine.—Chem. News, May 1, 1903, 215; from Journ. Soc. Phys. Chim. R., xxxiv, 52.

*Hydrogen Sulphide—Simple Generator.*—Frank. X. Moerk describes the simple hydrogen generator shown by Fig. 55, which may be inexpensively constructed as follows: In a one-gallon wide-mouth bottle *A*, nearly filled with dilute sulphuric acid, a student-lamp chimney *B*, is suspended, supported in the neck of the bottle by means of a paraffined wooden block. *B* contains a notched leaden disk, *f*, which supports the ferrous sulphide, and is closed by perforated rubber stoppers, the upper one a bent glass tube ending in a short piece of rubber tubing containing a tightly fitting glass plug *A*; the lower one provided with two valves, *b* and *c*, made of two sizes of glass tubing and perforated rubber stoppers, the lower one, *e*, in each valve being notched, the upper one perfectly smooth so that an ordinary cork, *d*, may either close the valve by being forced against the upper or open the valve by being forced downward. In use, the rubber tube at *a* is pressed so as to form a small channel along side of the glass plug; the acid is thus permitted to enter the lamp chimney through the valve *c* and generates gas, the valve *d* remaining closed; on releasing the pressure at *a*, the generation of gas continues until the pressure of accumulated gas forces the acid out of the chimney through the valve *d*, the upper valve remaining closed. Each time the generator is used, fresh or less saturated acid enters, this on being discharged sinks to the bottom of the bottle, because of its greater gravity, so that it is obvious that greater activity with the use of less acid is obtainable. By using hydrochloric acid in the bottle and

marble in the lamp chimney, the apparatus is converted into a "carbon dioxide generator."—Amer. Journ. Pharm., June, 1903, 257, 258.

FIG. 55.

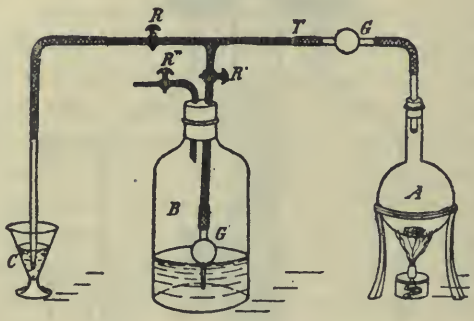



Hydrogen Sulphide Generator.

*Hydrogen Sulphide—Preparation by the Dry Way.*—E. Prothiére, in place of tallow or paraffin, which have long been known to yield hydrogen sulphide in copious quantites when heated with sulphur, recommends the use of petrolatum for the production of this gas in a dry way. He has found that the best yield is obtained by using 30 parts of petrolatum and 70 parts of sulphur. 100 Gm. of such a mixture, if completely utilized, yield 48.18 liters of hydrogen sulphide; ordinarily, however, only 25 liters are obtained in practice. The author has devised an apparatus for making the gas, which is shown by Fig. 56. The mixture of sulphur and petrolatum is heated in the flask *A*. *B* contains ammonia water. The parts of the apparatus shown in black are of hard rubber; the shaded parts are of rubber tubing and the balance of glass. To use the apparatus close the cock *R'*, open *R*, and apply heat to *A*. Hydrogen sulphide is

immediately evolved, and is conducted into the test-glass (or test-tube) *C*. When the gas is no longer required, remove the heat, when the disengagement ceases at once, close *R*, and open *R'*. The gas remaining in the apparatus is then absorbed by the ammonia in *B*. The residue remaining in *A* is charcoal, and this is readily removable. The bulbs *G* and *G'* collect any condensed sulphur that may have sublimed over.—Merck's Rep., April, 1903, 107; from Pharm. Ztg., 1902, 78.

FIG. 56.




Hydrogen Sulphide Generator: Dry Way.

*Dithionic Acid—Theory of its Formation.*—J. Meyer explains the preparation of the dithionates in the following manner: The action of $SO_2$ on $MnO_2$ does not at first produce either free dithionic acid or MnO, or sulphate of binoxide of manganese, but instead manganic sulphite (of the sesquioxide) and free oxygen; the manganic sulphite is then split up into dithionate and manganous sulphite. In fact, he has observed analytically the presence of sulphite in the products of the reaction done in the cold. If this interpretation is correct, the hydrates of the sesquioxides (being able to form protoxides) of iron, cobalt, and nickel, suspended in water, and treated with a current of $SO_2$ at about 0°, ought to form first a sulphite of the sesquioxide, which will then decompose as above into hyposulphate and sulphite of the protoxide. Experiments have shown that this is the case. For instance, with $Fe_2(OH)_6$, we first obtain a deep red liquid (ferric sulphite), which soon becomes decolorized and gives a very good yield of dithionate. On the other hand, $PbO_2$ does not react on $SO_2$ in the presence of cold water; HgO is the same. As for the other binoxides, $BaO_2$, $MgO_2$, $Na_2O_2$, and $H_2O_2$, when treated with $SO_2$, they give $H_2SO_4$ directly in the cold. The examination and study of the electric conductivity and the cryoscopy of the solutions of dithionates, confirm the opinion that the molecule of dithionic acid is indeed $S_2O_6H_2$. —Chem. News, Jan. 23, 1903, 48; from Berichte, *35*, 3606.

*Liquid Sulphur Dioxide—Solvent Power.*—According to Walden and Centnerszwer, liquid sulphur dioxide is a solvent in which a large number

of organic as well as inorganic substances are readily soluble, and their experiments show that sulphur dioxide forms complex compounds with many of these substances. Thus from solutions of potassium iodide in liquid sulphur dioxide the authors have obtained a crystalline compound, $KI.4SO_2$, which melts at + 0.26° C. (? Rep.). Similar compounds, for which the name "sulphones" is proposed, are in all probability formed by other salts.—Pharm. Journ., Feb. 28, 1903, 265; from Ztschr. Phys. Chem., through Nature, *67*, 352.

*Sulphurous Acid, B. P.—Convenient Process of Preparation.*—Richard A. Robinson gives the following details for preparing sulphurous acid, B. P., conveniently from the liquid sulphur dioxide of commerce: A large glass jar (capacity, 4 gallons or more), containing two gallons of distilled water, is fitted with a doubly-bored cork; through the one hole is a short, glass tube leading to a mercury trap outside; through the other a long, bent tube passing below the surface of the water in the jar. The arm of this tube is securely connected by rubber tubing to a lead pipe at the top of a cylinder of liquid sulphur dioxide, after the sealed end of the pipe has been snipped off with a strong pair of scissors. The evaporation of the $SO_2$ is not so rapid as to cause either unpleasantness or appreciable loss of gas while the connection is being made. The apparatus may then be left practically without attention till the evaporation is completed.—Pharm. Journ., Nov. 29, 1902, 551.

*Sulphurous Acid—Non-Injurious Effect as a Preservative of Dried Fruit.*—Marpman reports the results of numerous examinations of dried fruits that had been preserved by sulphurous acid, and concludes that the addition of sulphur fumes does not injure such fruits, since by prolonged exposure to air, or by washing in water, it is possible to eliminate all traces of the acid or of its salts. Thorough washing of the dried fruits should be resorted to in all cases, however.—Süd. D. Apoth. Ztg., 1902, 881.

*Sodium Sulphite—Variability of the B. P. Test.*—In the course of examination of sodium sulphite, Wm. Garsed noted that the results obtained by the B. P. test varied considerably according to the condition of the experiment. The dilution of the sulphite solution, the rate at which the volumetric solution was run in, the presence of excess of alkaline salts or mineral acid, each had a distinct influence on the result. The author records a number of experiments undertaken with the view of remedying the defects of the official test, and concludes that the following method, proposed by Giles and Shearer in "Journ. Soc. Chem. Ind." (*3*, 197), should take the place of the one at present indicated in the B. P. It is easy of application, is claimed to give exact results—a claim which is substantiated by experiments recorded in the present paper—and is carried out as follows: The powdered sulphite is weighed out, dissolved at once in a measured volume of $\frac{N}{10}$ iodine, and the excess of iodine determined

by means of $\frac{N}{10}$ sodium thiosulphate.—Pharm. Journ., March 14, 1903, 391–392.

*Alkaline Hydrosulphites—Composition.*—H. Moissan has investigated the nature and composition of the anhydrous alkaline sulphites with results which point to the correctness of the formula $Na_2S_2O_4$, assigned to sodium hydrosulphite, instead of $Na_2H_2S_2O_4$, found by other chemists. Potassium hydrosulphite, $K_2S_2O_4$, has been obtained by him by allowing $SO_2$ to come in contact, very slowly, with potassium hydride. The white mass thus formed, with the evolution of two atoms of hydrogen, is dissolved in oxygen-free water, from which solution it crystallizes in fine acicular needles. Unless the $SO_2$ be very gradually introduced into the tube containing the potassium hydride, incandescence, or even explosion, may result, with the formation of sulphides and sulphates. Sodium hydrosulphite, $Na_2S_2O_4$, is prepared in a similar manner, with sodium hydride, but the reaction between this compound and sulphurous anhydride takes place with such energy that unless the gas be diluted with hydrogen, sulphides and sulphates are formed. It crystallizes in two forms—in prisms and in acicular needles; the latter have the constitution $Na_2S_2O_4 + 2H_2O$. Lithium hydride also gives a hydrosulphite with $SO_2$, but reaction is much slower, and a gentle heat is necessary to complete the combination. Calcium and strontium hydrides combine, but although care has to be observed in the first introduction of the gas, it is necessary to increase the pressure towards the end of the operation in order to ensure complete combination. The reaction in all the above cases is represented by that of potassium hydride, $2KH + 2SO_2 = K_2S_2O_4 + H_2$. All the hydrosulphites are most powerful reducing agents.—Pharm. Journ., Feb. 14, 1903, 197; from Comptes rend., *135*, 647.

### SELENIUM AND TELLURIUM.

*Tellurium and Selenium—Reducing Action on Gold and Silver Salts.*—R. D. Hall and Victor Lenher have investigated quantitatively the reducing actions of metallic tellurium and selenium on solutions of the salts of gold and silver. They draw the conclusion that tellurium reduces a gold chloride solution completely to metallic gold, either in the warm or in the cold, and the only difficulties, so far as quantitative precipitation is concerned, are mechanical ones. The action of tellurium on silver salts in solution is to reduce them with formation of the telluride of silver, which is still a reducing agent, as it throws out gold from solution. The behavior of the product obtained is in all respects similar to that of the telluride of silver obtained by the reduction of silver telluride, and to that of the native mineral itself. The action of selenium is similar to that of tellurium, but is not so energetic. Selenium reduces silver solutions in the cold, but has no action on gold solutions unless heated nearly to boiling, the action then being fairly rapid and complete. With silver solutions selenium forms

silver selenide, which resembles silver telluride in being a reducing agent to solutions of gold salts, both of them being similar to the sulphide of silver in this respect.—Pharm. Journ., Jan. 10, 1903, 29; from Journ. of Amer. Chem. Soc., xxiv, No. 10.

PHOSPHORUS.

*Phosphorus—Crystalline Mixtures with Sulphur.*—R. Boulough observes that while apparently no phosphorus sulphide of definite composition is formed below 100°, there are found mixed crystals of sulphur and phosphorus rich in sulphur and isomorphous with octahedral sulphur, which can easily exist in the liquid state in false equilibrium. Besides these, crystals rich in phosphorus can be obtained isomorphous with this body, and which can be isolated even at a very low temperature, owing to the same false equilibrium. A further crystal conglomerated of the two species of mixed crystals containing 0.228 of sulphur to 0.772 of phosphorus, and which melts suddenly and completely at 9.8°, also exists, and may easily be confused with a definite compound.—Chem. News, Aug. 29, 1902, 108; from Comptes Rendus, cxxxv, No. 3.

*Phosphorus — Solubility in Different Liquids.*—C. Stich observes that phosphorus dissolves very slowly in most of its solvents, and frequent agitation for weeks is required before saturation is affected. He has determined its solubility in the following liquids, the weights given being the weights of phosphorus in 100 Gm. of saturated solution: Almond oil, 1.25; oleic acid, 1.06; liquid paraffin, 1.45; water, 1.0003; acetic acid, 96 per cent., 0.105.—Pharm. Zeit., *48*, 343.

*Pyrophosphorous Acid—Isolation and Properties.*—V. Auger has obtained pyrophosphorous acid, $H_4P_2O_5$, which has not been previously isolated, in the form of colorless needles melting at 38° C. It is very deliquescent, and is immediately hydrolized in the presence of water, forming phosphorous acid. When $PCl_3$ is treated with a little water a thick, oily liquid is formed, from which A. Besson had previously endeavored in vain to isolate $H_4P_2O_5$. If, however, more $PCl_3$ in the form of vapor be carried, by means of a stream of $CO_2$, through this oily liquid, a thick, clear liquid results in twenty hours, from which crystals of $H_4P_2O_5$ separate on exposure over KOH and recently fused $P_2O_5$. The same result is obtained by agitating together for five hours a mixture of $H_3PO_3$ and $PCl_3$, the latter in excess.—Pharm. Journ., May 2, 1903, 613; from Comptes rend., *136*, 814.

*Pyrophosphoric Acid—Acidity.*—Thomson having determined the heats of neutralization of a molecule of pyrophosphoric acid successively with one, two and four molecules of soda, H. Giran now completes the investigation by determining the acidity of the acid. He finds pyrophosphoric acid to be a tetrabasic acid possessing four strongly acid functions identical with one another.—Chem. News, July 18, 1902, 36; from Compt. rend., No. 25, 1902.

*Tri-Basic Sodium Phosphate—Industrial Uses and Commercial Quality.*—In view of the paucity of information in chemical text and reference books concerning tri-basic sodium phosphate, H. B. Eigelberner gives a brief description of the method of its preparation, chemical characters and composition. The consumption of this salt appears to be enormous, between 3 and 5 million pounds being consumed in this country alone, probably one-half of it going into the different boiler compounds used for preventing hard boiler crusts, much of the remainder in washing powders, for clearing water in laundries, and for various other detergent purposes, such as cutting the scum from milk cans, as a "casëin solvent," either straight or in combination with borax and other chemicals, etc. Tri-sodium phosphate, as found on the general market, runs between 95 and 99.5 per cent. pure, but is sometimes adulterated to the extent of 10 to 40 per cent. with glauber salts or soda ash.—Amer. Journ. Pharm., Dec., 1902, 596–597.

*Sodium Phosphate—Volumetric Determination.*—F. R. Dudderidge and J. S. Hill, in view of the fact that the B. P., 1898, gives no quantitative test for sodium phosphate, except to state that when "heated to dull redness it loses 62.84 per cent. of its weight," suggest that the U. S. Pharmacopœia process of titrating phosphoric acid with alkali up to the formation of $HNa_2PO_4$ works well with the phenolphthalein, which indicator is neutral to disodium hydrogen phosphate, a salt that is alkaline to methyl-orange. Taking advantage of the latter fact, and that $NaH_2PO_4$ is neutral to methyl-orange, they propose to estimate the purity of sodii phosphas, B. P. (the disodium salt) by titrating with sulphuric acid, when the end-point is formation of $NaH_2PO_4$, the next drop of standard acid producing the familiar pink solution. It is best to work with a strong solution of 3 grammes sodium phosphate and normal sulphuric acid. The authors have also applied the process to the determination of

*Sodium Arsenate*, using freshly re-crystallized salt, with equally good results, but they emphasize the necessity for using quite 3 Gm. of the crystallized salt, or its equivalent of the anhydrous, in fairly strong solution for each determination, as the end reaction is less sharp than in the case of the phosphate.—Trans. Brit. Pharm. Conf. 1902, 504–506.

*Potassium Phosphate—Occurrence in the Precipitate of Tincture of Pyrethrum.*—F. H. Alcock and H. W. Green have examined a crystalline sediment from 20 fluid ounces of tincture of pellitory submitted to them for identification by a friend. It weighed 0.53 Gm., was in acicular crystals, possessed a faint brown color, and proved to be potassium phosphate, $KH_2PO_4.OH_2$, associated with a minute quantity of a nitrate.—Pharm. Journ., Nov. 29, 1902, 554.

## BORON.

*Boric Acid—Solubility in Water and in Hydrochloric Acid.*—W. Herz

has made some experiments to determine whether the statement in Dammer's "Handbuch der Anorganischen Chemie," to the effect that boric acid is more soluble in hydrochloric acid than in water, is correct, and finds, on the contrary, that the opposite is true, the solubility steadily diminishing with increasing concentration of the hydrochloric acid. The solubility of boric acid in pure water was found to be 0.907 gramme equivalents per liter; while in 9.51 normal hydrochloric acid the solubility is only 0.338 gramme equivalents.—Zeits. anorg. Chem., *33*, 335.

*Boric Acid—New Color Reaction.*—Charles E. Cassal and Henry Gerraus find that an intense magenta-red color is produced on treating solutions containing boric acid with curcumin—or ordinary turmeric itself—and oxalic acid, and drying the mixture on the water-bath. The color is different to that obtained by the application of the ordinary turmeric test for boric acid, and the reaction is far more delicate, extremely minute quantities of boric acid being easily detected. The color is practically permanent for several hours—not less than ten or twelve—and fades very gradually on long keeping. The coloring matter is readily soluble in alcohol and ether without alteration, but is destroyed by the addition of water in excess. On treatment with alkali an intense blue color is obtained, which is different to that obtained on treating the "rose-red" coloring matter formed in the ordinary turmeric test, with alkali. In applying the test for detection of free or combined boric acid in milk and other food-products it is convenient as a rule to operate on an ash, under conditions which are explained under *Milk* (which see under "Organic Chemistry").—Chem. News, Jan. 16, 1903, 27, 28; from Br. Food Jour., Oct., 1902.

*Borax—Hydrolysis in Solution.*—H. S. Shelton, referring to the fact that borax has been shown by Shields to be slightly hydrolyzed into sodium hydroxide and boric acid, states that experiments on the diminution of conductivity on the addition of further quantities of boric acid show an increase of the hydrolysis when further diluted with water, as well as with increase of temperature. The hydrolysis in $\frac{N}{10}$ solution was estimated by Shields to be 0.5 per cent. at 25°, and the experiments of the author with $\frac{N}{200}$ solution showed 4 per cent. at 25° and 6 per cent. at 50°. Kahlenberg and Schreiner concluded from freezing-point determinations that six chemical individuals are present in a dilute solution of borax. Those chemical individuals seem to be $2H_3BO_3$,$2NaBO_2$, as shown by the following equation: $Na_2B_4O_7Aq + 3H_2O = 2NaAq, 2BO_2Aq + 2H_3BO_3$. The author has confirmed this by a number of direct experiments, amongst which the most important is the precipitation of $AgBO_2$, and determination of the boric acid remaining in the solution.—Pharm. Journ., July 5, 1902, 2; from Proc. Chem. Soc., *18*, 169.

## SILICON.

*Silicon—Properties of the Filamentous Form.*—H. Moissan and S.

Smiles find that the peculiar form of silicon in long, woolly filaments of a light coffee-brown color, obtained by passing induction sparks through $Si_2H_6$ under reduced pressure, has reducing properties which are not met with in the amorphous silicon of Vigouroux. Filamentous silicon slowly reduces $KMnO_4$ in the cold, and more readily on warming. It reduces $HgCl_2$ to HgCl at 60° C., and also auric chloride. This reducing action is attributed solely to the minute state of division of the silicon analogous to that previously observed by Moissan with boron.—Pharm. Journ., Aug. 16, 1902, 128; from Comptes rend., *134*, 1552.

*Infusorial Earth—Analysis of an Irish Deposit.*—Dr. T. L. Phipson directs attention to a diatomaceous deposit of considerable extent which has recently been discovered in County Antrim, Ireland, and which on analysis gave the following results: Water, 10.0; organic matter (containing crenic and apocrenic acid), 5.02; oxide of iron and alumina, 4.99; lime (chiefly), magnesia and alkalies, 1.20; silica, 78.79 per cent. The diatoms in this earth were extremely large and beautiful.—Chem. News, Dec. 12, 1902, 283.

*Chinese Red Earth—Use and Composition.*—Frank Browne, government analyst, calls attention to the usefulness of the so-called "Chinese Red Earth," which is extensively used in Hong Kong for building purposes. Its appearance somewhat resembles fine gravel, and it makes a strong and durable mortar when used instead of sand for mixing with lime. Analysis showed a good sample to have the following percentage composition: Silica, 63.8; alumina, 20.8; ferric oxide, 4.4; water, 10. Viewed under the microscope this material is seen to be almost entirely in sharp crystals. It is evidently derived from granite, of which some of the constituents had been removed in the process of weathering.—Pharm. Journ., Sept. 13, 1902, 276.

*Silicon Hydride—Properties.*—In continuation of their previous investigations (see Proceedings, 1902, 921), H. Moissan and S. Smiles find that the vapor density of silicon hydride, 2.37, agrees with the formula $Si_2H_6$, which points to the analogy to ethane or to silico-methane $H_3Si—SiH_3$. $Si_2H_6$ may be heated to 100° C. without undergoing decomposition. By sparking the gas, under reduced pressure, with an induction coil, it is dissociated, long filaments of silicon being deposited, while hydrogen is liberated. It is a very powerful reducing agent. Its action on bromine water is slow in the cold, but on warming, each bubble of the gas, as it passes through the solution, is coated with silica and takes fire spontaneously on reaching the surface. A similar action takes place with $HNO_3$. Strong HCl is without action on $Si_2H_6$; $H_2SO_4$ at 50° C. does not decompose it, but the bubbles on leaving this liquid emit a sharp report when they take fire on emerging into the atmosphere. The same occurs when $Si_2H_6$ is completely dried. Expecting it to be soluble in $CCl_4$, a little of the

gas was passed into it; immediately on contact a violent explosion resulted; HCl, carbon, and silicon were formed. With sulphur hexafluoride, which has been shown to be so far stable that sodium may be melted in it, $Si_2H_6$ also combines with explosive violence.—Pharm. Journ., Aug. 23, 1902, 211; from Comptes rend., *134*, 1,549.

*Silico-Ethane—New Method of Preparation.*—H. Moissan notes a new method of preparing the silicon analogue of ethane, $Si_2H_6$. This substance was originally obtained by the author, in conjunction with Dr. Smiles (see above), by the partial condensation at −200° C. of an impure silicon hydride prepared by the action of hydrochloric acid upon a silicide of magnesium of undefined composition. Attempts to prepare the same compound from the lithium silicide, $Li_2Si_6$, by the action of dry hydrogen chloride or a dilute solution of hydrochloric acid were unsuccessful, hydrogen being the only gaseous product. It has now been found that by the gradual addition of lithium silicide to concentrated aqueous hydrochloric acid, the silico-ethane is readily formed in abundance, and can be separated by means of cooling to the temperature of liquid air.—Pharm. Journ., Feb. 7, 1903, 161; from Compt. rend.

## CARBON.

*Carbon—Variation in Temperature of Combustion in Oxygen According to Allotropic Form.*—H. Moissan finds that the three allotropic forms of carbon differ considerably in the temperature at which they burn in oxygen, and further that in all cases before reaching the point of incandescence they combine quietly and form a considerable quantity of $CO_2$. Diamonds burn at between 800° and 875° C.; graphites between 650° and 700° C.; amorphous carbon between 300° and 500° C. In each instance, however, violent combustion is preceded by a period in which the combination of oxygen and carbon proceeds slowly at a temperature far below that of incandescence. In the case of wood charcoal this is as low as 100° C. at ordinary atmospheric pressure.—Pharm. Journ., Jan. 17, 1903, 62; from Comptes rend., *135*, 920.

*Diamond—Transformation into Black Carbon.*—During a series of experiments made some years ago to determine the heat of combustion of carbon in different states, and especially that of the diamond, Berthelot burnt diamonds incompletely in pure dry oxygen in crucibles placed in porcelain or hard glass tubes. He now mentions that the amount of amorphous carbon produced by this method was always very small, too small in fact to allow of a study of its isomeric state. It seemed probable, however, from his experiments that it contained some graphite.—Chem. News, Jan. 2, 1902, 11; from Compt. rend., *135*, No. 23 (Dec. 8, 1902).

*Diamond—Direct Conversion of Charcoal.*—Dr. Albert Ludwig has succeeded in producing diamond by the direct conversion of charcoal, which is the converse of Pepy's experiments. The latter had shown that

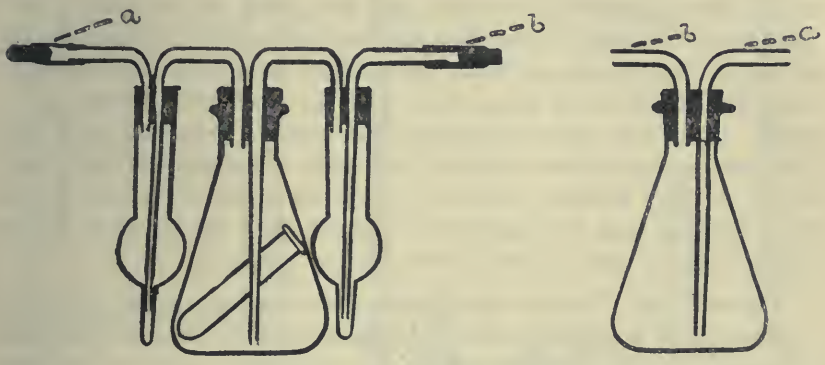
at a red-heat iron enters into combination with carbon as diamond by the change of a glowing iron wire, brought into contact with diamond, into steel. If it is required to change carbon directly into graphite, as is known, a very much higher temperature is needed. Dr. Ludwig has now been able to show that in all these reactions under strong, gaseous pressure (pressures up to 3,100 atmospheres were used) the formation of diamond results either at a lower temperature in the presence of iron (red heat) or at the melting-point of carbon without using such a contact agent. If it is required to convert charcoal into diamond without the presence of iron, numerous experiments showed that it is necessary to melt the carbon in an atmosphere at very high pressure. In fact, it was successfully proven that molten carbon is non-conducting, and is thus diamond—this being in accordance with a law of nature that all transparent elementary bodies are non-conductors of electricity. At the gaseous pressure used in this case, the carbon melts very easily by the help of a metallic arc lamp, and it was thus obtained in small spheres, about the size of a pea, of great hardness, and having the crystalline structure of natural carbonados (diamonds). The reaction might obviously be used to prepare diamonds, even in competition with natural diamonds, if certain easily-fulfilled conditions are maintained.—Chem. News, Jan. 2, 1903, 1 ; from Chem. Ztg., 1902, *25*, 89.

*Carbon Tetrachloride—Properties and Uses.*—Otto Raubenheimer describes tetrachloride of carbon and the various methods by which it may be produced. It is a very heavy (sp. gr. 1.60), colorless, transparent, mobile liquid, having a neutral reaction. Its taste is pungent, aromatic, cooling, but not sweet like that of chloroform. Its odor is agreeable and aromatic, resembling that of chloroform. The liquid is very volatile even at low temperatures. It is absolutely non-inflammable, its vapor does not take fire but it has the remarkable property of coloring a blue flame green and the green flame an intense blue. Another remarkable property of carbon tetrachloride is that it does not in the least affect the colors of fabrics. Even aniline colors of silk, satin, laces, etc., are not affected in the slightest degree. It is insoluble in water, diluted alcohol and glycerin. It is freely soluble in acetone, glacial acetic acid, oleic acid, liquid carbolic acid and aqueous solutions of carbolic acid, containing 85 to 95 per cent. of the acid. Also in crude carbolic acid, ethyl, methyl and amyl alcohol, chloroform and spirit of chloroform, carbon disulphide, benzol, ether and spirit of ether, aniline, oil of turpentine, petroleum and all petroleum products ; also in fixed and volatile oils and oleoresins. Carbon tetrachloride is itself one of the greatest of solvents. It dissolves oils, fats, wax, ceresin, spermaceti, paraffin, stearin, varnish, paints, shellac, asphaltum, pitch, resins, balsams, coal tar, pine tar, gutta percha, india rubber and soaps.—Pharm. Era, April 23 and May 14, 1903, 423 and 494.

*Carbon Dioxide — Cheap Apparatus for Estimations.* — Frank X. Moerk cheaply constructs an apparatus for carbon dioxide estimations, the

essential parts being some 2-ounce Erlenmeyer flasks, small chloride of calcium tubes—the smaller ends of which are closed by fusion—rubber stoppers, small glass tubing, suitably bent and drawn out into capillary tubes at one end, a 5-Cc. test-tube, two small sections of rubber tubing and some glass plugs for closing them. The details are well shown in the accompanying drawing (Figs. 57 and 58). In use, about 0.5 Gm. of the carbonate under examination is placed in the Erlenmeyer flask (Fig. 57), sufficient water is then added to cover the lower end of the capillary tube, and then the test-tube, charged with 4 Cc. of strong hydrochloric acid, is carefully lowered into the flask. The two chloride of calcium tubes, each filled to

FIG. 57. FIG. 58.




Apparatus for Estimations.

about one-half the height of the bulb with concentrated sulphuric acid are then attached, the ends, *a* and *b* being closed by the glass plugs mentioned. The apparatus thus well and carefully adjusted, wiped dry, and weighed, the plug *a* is removed and the apparatus inclined, so that a portion of the hydrochloric acid can escape from the test-tube and act on the carbonate; after effervescence ceases, repeat the operation until all the acid has thus been discharged from the test-tube. Then, having provided two air-drying flasks, constructed from Erlenmeyer flasks, as shown by Fig. 58, remove the plug *b* of the apparatus, and attach to *b* of the air-drying flask, and similarly attach the second air-drying flask at *a* to the apparatus at *a*, when, on applying motion at *b* of the second drying flask a current of perfectly dry air may be drawn through the apparatus, and the last traces of carbon dioxide thus removed, either by suction with the mouth or by means of an aspirator. It remains then only to detach the apparatus from the air-drying flasks, to insert the glass plugs and to weigh. Then connect the air-drying flasks, as before, and repeat the aspiration until constant weight is attained, the difference between the original and final weight being the weight of carbonic dioxide eliminated from the sample.—Amer. Journ. Pharm., June, 1903, 257–259.

CYANOGEN COMPOUNDS.

*Hydrocyanic Acid—Assay of Commercial Samples.*—S. F. Scott has assayed seven samples of (dilute, Rep.) hydrocyanic acid. Two of them were stronger than required by the U. S. Pharmacopœia, containing 2.49 and 2.4 per cent. respectively; three others were very deficient, containing 0.76, 0.54 and 0.49 per cent., and the remaining two contained no hydrocyanic acid at all.—Proc. Mich. State Pharm. Assoc. 1902, 55.

*Hydrocyanic Acid—Improvement in the Use of Schönbein-Pachenstecher Test Paper.*—J. C. Brännich has had frequent opportunity to use the Schönbein-Pachenstecher test paper for the determination of hydrocyanic acid generated, under fermentative action, from plant substance, such as fodder plants, sorghum, maize, etc., and has made the observation that the presence of formalin intensified the reaction markedly, although owing to the fact that its presence in the liquid under examination arrests or prevents the production of hydrocyanic acid the contrary effect was anticipated. If the test paper is moistened with formalin instead of water, and it is then suspended over the liquid undergoing fermentation, the faintest traces of HCN produces instantly a deep blue color on the paper, this color differing from the light blue produced when the paper is simply moistened with water.—Chem. News, April 9, 1903, 173.

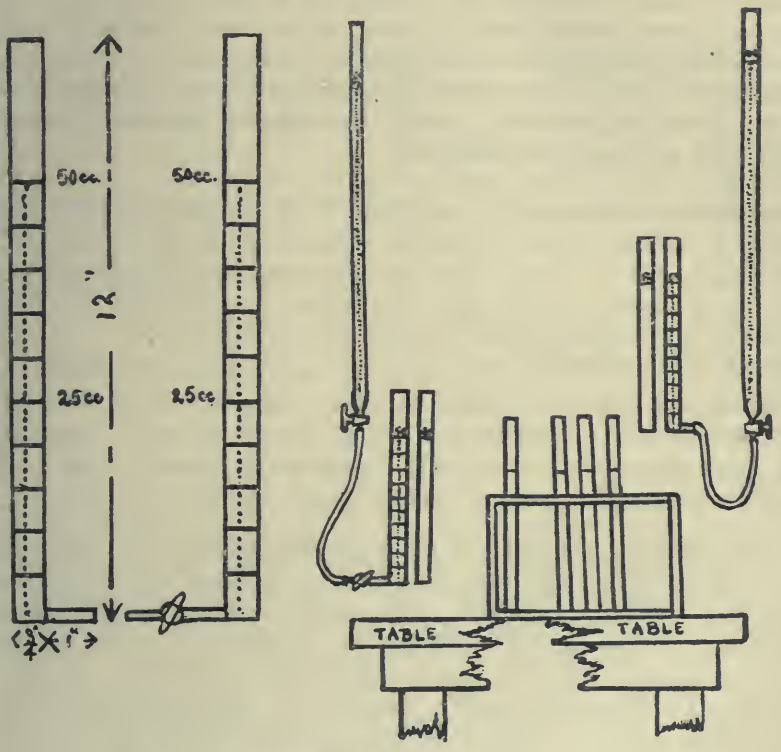
*Cyanides and Cyanates—Simultaneous Estimation.*—Ernst Victor recommends the following method for the simultaneous estimation of cyanides and cyanates, which depends on the solubility of cyanate of silver in dilute nitric acid. Two portions of 10 Cc. each of the 10 per cent. mixture are treated with a known excess of decinormal nitrate of silver. One portion made up to 100 Cc. is filtered and the excess of silver titrated in an aliquot part of the filtrate. The other portion is treated first with dilute nitric acid, made up to 100 Cc., and the excess of silver determined in the same manner. The difference between these two titrations gives the amount of cyanate contained in the sample. The author criticises the propositions put forward by Feldtmann and Buttel with regard to the same estimation. Unlike them, he did not find it necessary to work at a temperature of 0° to precipitate the cyanate of silver at the same time as the cyanide. At a temperature of 25°, it is only after the lapse of several hours that the decomposition of the cyanate into ammonia and bicarbonate of potassium is noticed, and not the transposition, $OCNK + 2H_2O = CO_3KH + NH_3$.—Chem. News, Nov. 14, 1902, 245; from Ztschr. Anal. Chem., *40*, 462.

ALKALIES.

*Ammonia—Modification of Nessler's Tube.*—Calling attention to the almost indispensable requirement of the "Nessler" jar for the determinations of ammonia in water, Dr. Herbert J. Watson describes a modification of the usual, expensive forms, which is illustrated by Fig. 59. The jar is

12 inches in length, ¾ inch in diameter, about 9 inches from base to top mark (50 Cc.), and graduated in 5 Cc. with dashes for the 1 Cc. graduations. There is a small tube projecting from the side at the base, which may be either plain or have a stop-cock. A number of plain tubes similar to the above, with a 50 Cc. graduation, are necessary to collect the distilled ammonia. The method of using this side-necked "Nessler" jar, which originated with Professors Chester and Robin, consists of connecting side tube with a burette by a small rubber tube. The three tubes of

FIG. 59.




Modified Nessler's Tubes.

free and albuminoid ammonia, having been collected from the condenser and "nesslerized" in the usual manner, are mixed together, causing a similar shade in each. One of these tubes is placed beside the one connecting with a burette containing the standard ammonia solution, and moved with a vertical movement. The liquid in the standard column is made to increase and decrease at will, and the number of cubic centimeters is always visible.—Amer. Journ. Pharm., April, 1903, 166–168.

*Ammonia — Delicate Reaction with Diamidophenol.* — Manget and Marion find that amidol (diamidophenol) gives a yellow color with solu-

tion of ammonia, of an intensity superior to that produced by Nessler's reagent—the color being easily seen in solutions containing 1 part of ammonia in 1,000,000 parts.—Pharm. Journ., March 28, 1903, 458; from Annal. de Chim. Annal., *8*, 83.

*Ammonium Carbonate—Commercial Variations and Pharmacopœial (B. P.) Definitions.*—Cowley and Catford, in a practical paper describing the method of utilizing any kind of commercial ammonium carbonate for preparing B. P. solutions of ammonium acetate and citrate, observe that the commercial carbonate has, perhaps, varied slightly in composition during the past half century, but not so much as the Pharmacopœial definitions. As sal volatile, sesquicarbonate, or carbonate, until 1885 it had been officially regarded as a homogeneous salt, although it had long been observed from the action of solvents, water and alcohol, to be capable of yielding two different salts, which, represented in the then prevalent equivalent notation, were as follows:

COMPOSITION OF SESQUICARBONATE OF AMMONIA IN THE OLD (EQUIVALENT) NOTATION.

| | $NH_3$ | $CO_2$ | HO | Per cent. $NH_3$(C=6, O=8). |
|---|---|---|---|---|
| Anhydrous monocarbonate | 17 + | 22 | .. | 43.7 |
| Hydrated bicarbonate | 17 + | 44 + | 18 | 21.6 |
| Sesquicarbonate | $2NH_3$ | $3CO_2$ | 2HO | 28.8 |

The first being producible by direct combination of dry $CO_2$ and $NH_3$, and also by sublimation from the chloride or sulphate with carbonate of potash or soda instead of chalk. Any moisture produces hydrated monocarbonate; this was once in the Dublin Pharmacopœia as $2(NH_3CO_2)HO$, and was formed in the P. L. process for spirit of sal volatile. The plausability of the ammonium theory of Ampère led to various shufflings of the constituent elements, so that it became successively carbonate of hydramide $HNH_2CO_2$, also carbonamide $NH_2CO.HO$, and finally the monobasic ammonium salt of the hypothetical carbamic acid, or $NH_4NH_2CO_2$ in the notation of the day. The varying percentages of ammonia in the carbonates of the last three pharmacopœias are attributed entirely to varying proportions of the two constituent salts, although analysts, as H. Rose, have found different hydrates in samples of the sublimed preparation. The present B. P. does not attempt to define, by a chemical formula, that which its predecessor styled a "compound molecule," but it is now more aptly described as a "variable mixture." The following table exhibits a comparison of the ammonium carbonate of successive British Pharmacopœias (from 1851–1898), calculated uniformly to 1898 atomic weights:

| | $(NH_3)_2CO_2$ = 77.55. | $NH_3H_2OCO_2$ = 78.49. | Combined Molecular Weights. | Per cent. $NH_3$ by | | Acid Carb. |
|---|---|---|---|---|---|---|
| | | | | Formula. | Vol. Test. | |
| Ammonia sesquicarb., P. L., 1851 ..... | | | | | | |
| Ammonia carbonate, B. P., 1864 ..... | 1 molecule | +2 molecules | = 234.53 | 28.89 | 28.91 | 66.93 |
| Ammonia carbonate, $N_4H_{18}C_2O_8$, B. P., 1867 | | | | | | |
| Ammonium, $N_3H_{11}C_2O_6$, B. P., 1885 ..... | 1 molecule | +1 molecule | = 156.04 | 32.57 | 32.62 | 50.3 |
| Ammonium $N_7H_3,C_6O_{13}$, B. P., 1898 ..... | 2 molecules $2(NH_4NH_2CO_2)$ | +3 molecules $+3(NH_4HCO_3)$ | = 390.57 | 30.36 | 30.49 | 60.29 |

—Pharm. Journ., Nov. 29, 1902, 591, 592.

*Lithium Silicide—Formation and Characters.*—H. Moissan has obtained lithium silicide, $Si_2Li_6$, by heating together lithium and silicon, *in vacuo*, for two to three hours, a dull red heat only being attained at the end of the process. The excess of lithium is then distilled off, the apparatus being kept at above 400° C. but below 500° C., when the whole of the uncombined lithium distils, leaving a residue of lithium silicide. It forms small, deep indigo-blue crystals, having the sp. gr. 1.12. It is dissociated *in vacuo* above 600° C. Below that temperature hydrogen is without action on it; above 600° $Li_2H_6$ is formed. When gently warmed in fluorine decomposition takes place with incandescence, fused lithium fluoride and gaseous silicon fluoride resulting; a similar reaction takes place with chlorine. Heated on platinum in the air it burns and perforates the platinum. In oxygen it burns with a brilliant light, evolving much heat. It also burns brightly when combining with sulphur, lithium polysulphide and silcon sulphide resulting. It is in fact a powerful reducing agent, reducing ferric and chromic oxides and the oxides of manganese. If a small fragment be dropped on the surface of monohydrated sulphuric acid it ignites and moves about on the top of the liquid; with nitric acid ignition takes place with explosive violence. It also becomes incandescent with HCl, but the hydrated silica which forms round the particle hinders the reaction; with dilute HCl, $Si_2Li_6$ gives off a spontaneously inflammable gas, burning in the air with a white flame. When thrown into small quantities of water violent reaction takes place, the liquid becomes alkaline and evolves a spontaneously inflammable gas, but if the action be rendered slow, by first covering the silicide with glycerin, the gas evolved does not burn spontaneously. It is in fact pure hydrogen. In the first case there is present in the gas $Si_2H_6$, which imparts the igniting property to all the gas; in the second instance that gas, as formed, is decomposed by the alkaline liquid, only hydrogen being evolved.—Pharm. Journ., July 19, 1902, 43; from Comptes rend., *134*, 1,083.

*Potassium Hydride—Influence of Very Small Quantities of Water on its Reaction with Carbon Dioxide.*—During a synthesis of alkaline formates,

Henri Moissan found an example of the part which a very small quantity of water plays in a reaction. He proves experimentally that from $-85°$ to $+54°$ potassium hydride does not combine with absolutely pure gaseous carbon dioxide. During this interval of temperature the trace of water corresponding to the vapor tension of ice at $-85°$ is sufficient to start the reaction, owing to the heat which is evolved by the violent decomposition of a very small quantity of the alkaline hydride. After once starting, enough heat is evolved to continue the reaction, and the change rapidly becomes total. During his experiments on the ordinary combination of carbon dioxide and the hydride, the influence of this trace of water is unimportant.—Chem. News, April 17, 1903, 191; from Compt. rend., *136*, No. 12 (March 23, 1903).

*Crude Potassium Carbonate—Contamination with Arsenic.*—C. E. Carlson has found appreciable quantities of arsenic in a lot of crude potassium carbonate examined by him. It was of German origin, and possibly a product from the wool washeries.—Pharm. Centralh., 1902, 617.

*Rubidium-Ammonium Bromide—Use in Epilepsy.*—Laufenauer finds rubidium-ammonium bromide to be superior, as a nervous sedative, to all the other bromides in one-third of all the numerous cases of epilepsy treated by him. In the remainder it was found to be at least equal in effect to KBr. The daily dose given was from 60 to 110 grains. A mean dose of 60 to 75 grains given in the evening had satisfactory sedative and hypnotic effects. It is thus prescribed: Double bromide of ammonium and rubidium, 6; distilled water, 100; syrup of lemon, 20. Each tablespoonful of this mixture contains about 11 grains of the double salt.—Pharm. Journ., Dec. 27, 1902, 708; from Bull. gen. de Therap., *144*, 637.

*Rubidium and Cæsium Hydrides—Formation and Properties.*—H. Moissan has obtained rubidium hydride, RbH, in the form of a crystalline sublimate by passing pure dry hydrogen over metallic rubidium in a tube the lower portion of which is heated to 300° C. The hydride condenses in the cooler portion of the tube, in the form of colorless, microscopic prismatic needles in a white mass. The density is about 2.0. Heated *in vacuo*, the hydride is dissociated below 300° C., giving the metal the form of a brilliant liquid, which, at this temperature, does not attack glass. Cæsium hydride is prepared in a similar manner; but metallic cæsium is less easy to manipulate than rubidium, since it takes fire with the least contact of air, so that it is difficult to free it from the covering of naphtha in which it is preserved. The hydride formed is less volatile than that of rubidium, sometimes forming a crust covering the metal. Its brilliant crystals are more flattened than those of rubidium. Its density is 2.7. Both hydrides ignite in fluorine, forming fluorides and hydrofluoric acid. They also take fire with liquid chlorine; when this action is incomplete, rubidium hydride yields a green subchloride, cæsium hydride gives an

orange-yellow residue. Both combine readily with bromine, but with iodine heat is necessary to bring about combination. Both take fire in oxygen at ordinary temperatures, as well as in atmospheric air. In pure, dry nitrogen they give when heated a mixture of nitride and amide of the respective metals; this is decomposed by water with the evolution of ammonia. This reaction distinguishes these hydrides from those of potassium, sodium and calcium. Both hydrides are rapidly decomposed by cold water without incandescence, forming the metallic hydrate and evolving hydrogen. Although unattacked at ordinary temperatures by $CO_2$, on warming the hydrides in an atmosphere of that gas marked action takes place, a formate of the metal resulting. In a rapid stream of $SO_2$ they ignite, forming sulphide and sulphate; but if the gas be introduced slowly the hydrosulphites $Rb_2S_2O_4$ or $Cs_2S_2O_4$ are obtained. In gaseous or liquefied ammonia they are slowly transformed into amides.—Pharm. Journ., April 18, 1903, 557; from Comptes rend., *136*, 587.

ALKALINE EARTHS.

*Barium—Compounds Formed by the Action af Ammonia on the Metal.*—According to Mentrel, when gaseous ammonia is passed over metallic barium, no reaction is obtained above 28° C.; but if the temperature is reduced a reddish-brown solid is formed which, when the temperature falls below —23° C., is transformed into a blue liquid. Towards —50° C. this separates a deep blue oily substance, sparingly soluble in the liquid ammonia, which it tints pale blue. If the temperature be allowed to rise above —15° C., the barium ammonium formed is converted into barium amide.

*Barium Ammonium* appears to have the formula $Ba(NH_3)_6$, while H. Moissan has shown that calcium ammonium is $Ca(NH_3)_4$. It would appear, therefore, that the metals of the alkaline earths combine with more ammonia as the atomic weight rises. Barium ammonium ignites on contact with air, and is energetically decomposed by water. It obsorbs oxygen at low temperatures, and with $NO_2$ gives a solid white barium hyponitrite, $Ba(NO)_2$. Carbon monoxide also combines with barium ammonium, in ammoniacal solution, forming a new compound, barium carbonyl, $Ba(CO)_2$, which is a yellow solid, decomposed, without explosion, on contact with air, or when heated. When gaseous ammonia is passed over barium, heated to about 280° C., the greyish liquid at first formed becomes green, and finally red, as the temperature rises. This is due to the formation of

*Barium Amide*, $Ba(NH_2)_2$. This compound boils at 460° C.; at 650° C. an orange-yellow solid body is formed, which does not remelt below 1000° C. If this be allowed to cool in a current of ammonia it reassumes the liquid condition at about 400° C. These changes are due to the transformation of barium amide, $Ba(NH_2)_2$, into the nitride, $Ba_3N_2$, by heat. On cooling, this nitride is reconverted into the amide. Lithium

amide is found to behave in a similar manner.—Pharm. Journ., April 11, 1903, 525; from Comptes rend., *135*, 740.

*Barium Chloride—Use as a Heart Tonic.*—Schaedel recommends barium chloride as an efficient and reliable heart tonic in place of digitalis. Given in doses of from 0.02 to 0.05 Gm., it is said to increase the blood pressure and to reduce the frequency of the heart's action.—Am. Journ. Pharm., June, 1903, 286; from Ber. Klin. Wchschr., 1903, 278.

*Aluminate of Barium—Use and Value as a Boiler Disencrustant.*—G. Arth directs attention to aluminate of barium, a product obtained from barium sulphate and beauxite, a solution of which is used for the prevention of boiler incrustations, and gives the results of experiments undertaken with a view to obtaining some practical hints as to the best manner of using it. He found that the solution as supplied, gives a white deposit, even when kept closely stoppered, and this deposit goes on forming for at least two months, and its strength drops from 5° B. to 4° B. The solution is used principally with waters containing sulphate of lime before entering the boiler, and the reaction is generally admitted to be $BaO.Al_2O_3 + CaO.SO_3 = BaO.SO_3 + CaO.Al_2O_3$, both compounds formed being equally insoluble. However, this reaction does not agree with what has been observed in practice, viz., that it requires considerably less baryta than is present according to the equation to purify a given water; that is to say, the decomposition is not effected molecule for molecule, between the baryta and sulphuric acid present. The author has observed that no matter what proportions of sulphate of lime and aluminate of baryta are present, after the reaction there is always lime in the precipitate and in the liquid in which the latter is formed. The precipitate is never formed exclusively of sulphate of barium and aluminate of lime. As a result of experiments he found that it is quite possible to precipitate a given quantity of sulphate of lime with a theoretically insufficient amount of aluminate of barium, but the liquid left after the operation is never quite free from soluble compounds.—Chem. News, Nov. 21, 1902, 257; from Bull. Soc. Chim. (3), 27, No. 8.

*Monohydric Magnesium Phosphate—A New Urinary Deposit.*—Dr. T. R. Bradshaw describes a new urinary deposit, monohydric magnesium phosphate, $MgHPO_4$, which occurred as a sediment in the alkaline urine of a patient treated with magnesium carbonate. The deposit was formed of extremely narrow, elongated needles, which were practically insoluble in water, but readily dissolved in acetic acid. On heating to 400° C. on a platinum foil, they were converted into magnesium pyrophosphate. The occurrence of this salt in the urinary secretion does not appear to have been previously recorded.—Pharm. Journ., Aug. 16, 1902, 127; from Lancet, 1, 1902, 1241.

EARTHS.

*Aluminum—Increase in Density and Ductility.*—According to a German patent granted to W. Rubil, the addition of 3 to 15 per cent. of phosphorus to metallic aluminum changes the physical properties of this metal to such a degree that it becomes applicable to quite a variety of purposes, for which, on account of its soft (brittle? Rep.) character, it has not been used.—Amer. Journ. Pharm., March, 1903, 143.

*Aluminum—Method of Platinizing.*—See *Platinized Aluminum Vessels*, under "Apparatus and Processes."

*Aluminum Chloride—Compounds with Hydrogen Sulphide.*—Möhler has shown that anhydrous aluminum chloride, when sublimed in a current of hydrogen sulphide, retains a certain quantity of this gas. The product obtained has never been analyzed. E. Baud has now investigated this substance to find whether the sulphohydric compounds of aluminum chloride are comparable to hydrates or ammoniacal compounds. He finds that under the action of liquid hydrogen sulphide—(1) a compound, $Al_2Cl_6.H_2S$, stable at ordinary temperatures, is formed; (2) a compound, $Al_2Cl_4.2H_2S$, which is dissociable towards —45°, is formed. It is possible that the solution of $Al_2Cl_6$ in liquid $H_2S$ contains a compound still richer in hydrogen sulphide.—Chem. News, July 11, 1902, 24; from Compt. rend., No. 24, 1902.

*Aluminum Chlorosulphate—Preparation and Properties.*—A. Recoura, by crystallization of a solution of aluminum sulphate in boiling hydrochloric acid, obtains the chlorosulphate of aluminum, $AlSO_4Cl+6H_2O$. This substance is very soluble in water and very slightly soluble in alcohol. Cryoscopic measurements show that the solution in water is not, even at first, anything more than a simple mixture of aluminum sulphate and chloride. The lowering of the freezing-point of the aqueous solution of this compound is the sum of the respective lowerings of the sulphate and the chloride. The various experiments performed on this salt led the author to believe that it has the same constitution as chromium chlorosulphate.—Chem. News, Nov. 28, 1902, 269; from Compt. rend., *135*, No. 18 (Nov. 3, 1902).

*Aluminum Sulphate—Use and Value for Fire-Proofing Wood.*—Prof. Samuel P. Sadtler gives some interesting information concerning the fire-proofing treatment of wood in general and the apparatus and process invented by Mr. Jos. L. Ferrell in particular. After a most exhaustive series ef experiments, extending over several years, with a wide range of compounds, Mr. Ferrell found in aluminum sulphate an ideal compound that answers all the requirements for successfully fire-proofing wood. It has the additional feature, of no slight importance in its bearing upon the fire-proofing effect, that when strongly heated it leaves an infusible and non-conducting residue to cover and protect the cellular structures throughout

the wood. It absolutely prevents the propagation not only of flame throughout the wood, but even of a glow, because of its non conducting and unalterable character. Aluminum sulphate is far more efficient than alum, the alkaline sulphate contained in the latter detracting from the power of the aluminum sulphate in making wood fire-resistant. Furthermore, by means of the apparatus and process invented by Mr. Ferrell, and the use of aluminum sulphate, the treated wood is in no way inferior in strength to the untreated wood, this fact having been established by a large number of physical tests by competent experts of high reputation.—Amer. Journ. Pharm., Dec., 1902, 590–596; from "Science," Sept. 12, 1902.

*Salts of the Rare Earths—Activity of Certain Ones as Oxidizers.*—The spontaneous oxidation of potassium-cerium carbonate, and the oxidations resulting from contact with it, is so marked that André Job has undertaken the further examination of this type of phenomena. Other salts of cerium exhibit the same reactions, and it is found that for atomic equivalent quantities cerium acetate has an activity at least as great as manganese acetate itself. Cerium acetate is a very stable salt, its solution, when exposed to the air, remains limpid and colorless, and shows no sign of spontaneous oxidation. In the course of his experiments, the author finds a quite unexpected example of similar activity in the case of lanthanum, and a result of his experiments is that undoubtedly there exists a peroxide of lanthanum, a hitherto undiscovered fact. At present it is not certain whether or not this oxide corresponds to the hydrate precipitated by hydrogen peroxide. He is continuing his investigations on this matter.—Chem. News, Jan. 30, 1903, 59; from Compt. rend., *136*, No. 1 (Jan. 5, 1903).

*Cerium and Thorium—Origin of the "Welsbach" Light.*—From a brief account of the invention of the incandescent Welsbach mantle, the following interesting information is gathered: Auer von Welsbach, while engaged in the spectroscopic examination of the light emitted by incandescent erbia and other rare earths, found that a small fragment of the earths held on platinum wire did not give sufficiently bright spectra. In order to increase the available illuminating surface, he adopted the plan of impregnating pieces of cotton fabric with the salts of the earth. When the cotton was subsequently burnt out the residual oxides were found to be sufficiently coherent for his purpose. Lanthanum oxide treated in this way glowed so brilliantly as to suggest the possibility of applying it to practical illuminating purposes, and thus the idea of the "incandescent mantle" originated. But a mantle of lanthanum oxide was found to disintegrate when exposed, owing to absorption of moisture and carbon dioxide. This led to the use of the oxides of other rare metals, notably zirconia and thoria, in admixture with lanthana, for the purpose of imparting stability to the mantle, and the further observation, by v. Welsbach's assistant, Haitinger, of the value of small percentages of ceria in improving the illuminating power of

the mantles. Conceiving, however, that thoria might prove the most useful earth for this purpose, an investigation of the nature of this oxide was undertaken, in the course of which the astonishing discovery was made that the purer the thorias were the lower the illuminating power of the mantles, until finally a point was reached at which the mantles had very little illuminating power at all. Further researches to find the light-existing substance developed that this was in reality the ceria which clings to thoria so persistently that it can be removed therefrom only with the greatest difficulty. Cerium solution being added to the solution of purified thorium proved the solution of the problem, the proper adjustment of the proportions resulting in the well-known thoria-ceria mixture used in the Welsbach mantles of the present day.—West. Drug., July, 1902, 386 ; from Sc. Amer.

*Cerium Silicide—Preparation and Characters.*—Sterla has obtained cerium silicide, $CeSi_2$, in the form of steel-grey, brittle, microscopic crystals, by heating together in the electric furnace cerium oxide and pure crystalline silicon. Reaction is immediate, and is complete on fusion. The button of crude silicide is freed from adhering silicon by digestion on water-bath with caustic potash, when $CeSi_2$ is left in a pure crystalline condition. It is insoluble in water, has the sp. gr. 5.67 compared with water at 17° C., and is insoluble in organic solvents. Hydrogen is without action on it at all temperatures. Fluorine combines with it, in the cold, with incandescence; iodine, bromine, and chlorine only when heated. At ordinary temperatures, air and oxygen are without action on it, but when heated to redness the latter combines, and, in a flame, $CeSi_2$ burns with brilliant sparks. Sulphur and selenium combined with it at their boiling-points with a slight emission of light. Gaseous HCl attacks it at a red heat. HCl and HF in solution and other mineral acids decompose it, liberating hydrogen. Organic acids only react with it when heated. Alkalies in aqueous solution have no action, but the same in a state of fusion combine, with incandescence. $CeSi_2$ melts in the electric furnace, forming a crystalline, silvery mass when cooled. In general properties it differs from calcium silicide, and resembles the compounds of silicon with the heavy metals. It is quite distinct from the cerium silicide, $Ce_2Si$, obtained in 1865 by Ulik, by the electrolysis of cerium fluoride and of potassium.—Pharm. Journ., Sept. 26, 1901, 295 ; from Comptes rend., *135*, 170.

*Ceric Chromate—Preparation, Properties and Composition.*—Philip E. Browning and Charles P. Flora separated from the mixed oxides of a cerium earth, by treatment with chromic acid in decided excess a product which was crystalline, bright scarlet in color, and shows by analysis to have a composition agreeing with the formula $Ce(CrO_4)_2.2H_2O$. It loses chromic acid when treated with water, may be heated to 150° C. without apparent decomposition, but is decomposed at 185° C.—Chem. News, April 9, 1903, 173 ; from Amer. Journ. Science, (4), xv, No. 87.

*Thorium—Separation from its Associate Earths.*—Floyd J. Metzger makes a preliminary announcement on a new method of separating thorium from cerium, lanthanum, and didymium. He finds that from a 40 per cent. alcoholic solution, thorium is precipitated quantitatively on the addition of fumaric acid, while no change is produced by that reagent in cold solutions of cerium, lanthanum, or didymium. When thorium is precipitated in this way in the presence of the above-mentioned elements traces of these are carried down with the thorium, but may be removed by a single reprecipitation. A number of other weak organic acids are being investigated in the same way, and several of these show interesting results. —Journ. Amer. Chem. Soc., *24*, 275.

*Terbium—Question of Existence.*—R. Marc has made an elaborate investigation concerning the existence of terbium earth, which, of all the rare earths, has been most disputed. Krüss and Hofmann proved that the yellow oxide, which Marignac and Lecoq regarded as a compound of terbium, is not a single substance. By a special method of separation the author has now succeeded in decomposing into a series of four members an earth, which corresponded to the preparations of terbium of the above authors, and possessed an atomic weight of 158; the atomic weights of the first and last members of the series were respectively 152 and 161. Exhaustive researches have, however, led the author to results which he interprets, differently from Krüss and Hofmann, as follows:

1. Terbium oxide possesses a deep brown ochre color.

2. The earths previously known as terbium earths are mixtures of yttria with another substance, which is much heavier, colorless, and has no spectrum (probably ytterbium); these mixtures are colored by small quantities of terbium oxide.

3. Terbium forms two oxidation products, of which the higher is colored and the lower colorless (like praseodymium).

4. Terbium probably possesses an absorption spectrum, which consists essentially of the bands $\lambda$ 464–461.

The material employed by the author consisted of the lighter-colored oxides, which were separated by Dr. A. Weiss in the preparation of didymium from monazite by the chromic acid method of Muthmann and Böhm. The oxides had a yellow color, and showed in the absorption spectrum bands of erbium, neodymium, and samarium. The dark color of the material was very surprising, terbium having heretofore been described only as dark yellow.—Chem. News, Aug. 15, 1902, 73–75; from Berichte, *35*, 389.

*Ytterbium—Classification.*—The investigations of A. Cleve show that ytterbium is a purely trivalent element, forming many compounds specially characteristic of the trivalent metals, such as the gold double chloride, the acid selenite, the potassium double ferrocyanide, the potassium double chromate, the periodate, $YbIO_5$, and the basic carbonate, $R.OHCO_3$.

Even in acid solutions neutral ortho salts of tribasic acids, such as the phosphoric acid, are formed. The close relationship of ytterbium to yttrium is specially apparent in the platinum cyanide. This salt is externally completely similar to the corresponding yttrium compound. Ytterbium can thus be classed together with yttrium, erbium, gadolinium, and possibly other metals which have as yet not been prepared in the pure state in a natural group, based on the similarity of the platinum cyanides. It is apparently most closely allied to erbium among these metals, both as regards the composition of many of its salts and the comparatively great solubility of its sulphate.—Pharm. Journ., Jan. 10, 1903, 30; from Ztschr. Anorgan. Chem., xxxii.

## MANGANESE.

*Manganese—Rapid Estimation in Steel.*—The methods employed at the present time in steel works for the estimation of manganese in steel are nearly all volumetric, and are modified according to the well-known method devised by Volhard, which gives very precise and satisfactory results. But the manipulation is tedious, and may be very much shortened with perfectly reliable results by the following modification, which is prepared by Charles Ramorino: Two Gms. of the sample steel, taken by means of a drilling machine, are attacked with 30 Cc. of nitric acid, density 1.20. The attack takes place suddenly in the cold; the metal is allowed to dissolve until we notice flocculent portions of carbon mixed with iron floating about the surface. The solution is completed by heating over a Bunsen burner and boiling for some minutes, until the fumes of the hyponitrite are completely driven off. Then we carefully pour in 20 Cc. of bromized hydrochloric acid, prepared by mixing 10 Cc. of strong hydrochloric acid, density 1.19, and 10 Cc. of strong bromine water. This is boiled, keeping the beaker covered over with a funnel, and kept at the boiling point for ten minutes until the expulsion of the bromine fumes is complete. We then dilute the solution with about 200 Cc. of cold distilled water. The whole is then poured into a flask of one liter capacity, and we add 200 Cc. of boiling distilled water and 25 Gms. of pure precipitated oxide of zinc. This is allowed to settle, and titrated permanganate is run in from a burette until the rose color is persistent. Several estimations can thus be made in from 15 to 20 minutes. It is necessary to pay attention to the purity of the oxide of zinc used in the process.—Chem. News, Dec. 12, 1902, 283; from Monit. Scient. (4), *16*, 419.

*Manganese Dioxide—Method of Preparation for Medicinal Use.*—August Gotthelf has devised the following practical method for preparing manganese dioxide of approximately constant composition and suitable for medicinal use, which is based upon the quantitative method proposed by Prof. Jannasch for the estimation of manganese: A mixture of 250 Cc. each of 10 per cent. ammonia water and 3 per cent. hydrogen dioxide is diluted to 1000 Cc. with water and added, with constant stirring, to a

solution of 50 Gm. of crystallized manganese sulphate ($MnSO_4.4H_2O$) in 1000 Cc. of water. After washing several times by decantation, the precipitate is transferred to a filter and the washing continued until free from sulphate. It is then dried at 150° C., the yield being about 30 Gm. The product is fairly constant in composition, which approximates to 4MnO.-20 to 25 $MnO_2$, and contains about 4 per cent. of water. The presence of some manganous oxide in this product is unavoidable, but is considered an advantage from a therapeutic point of view. It is impracticable to eliminate the water completely without also driving off a portion of oxygen by the high temperature necessary.—Amer. Journ. Pharm., May, 1903, 214–216.

*Potassium Permanganate—Successful Use for Snake-Bite.*—A correspondent of the "Lancet" records two cases of snake-bite cured in the Argentine by the injection of potassium permanganate, one a child, the other a dog. It is not stated whether the inoculation of the dog left an indolent ulcer, as has been stated to be the after-result of some experiments on the subject.—Pharm. Journ., Jan. 3, 1903, 13.

*Manganese Aluminate—Preparation and Properties.*—E. Dufau has obtained manganese aluminate, $MnAl_2O_4$, in the form of small, bright-yellow, transparent, octahedral crystals, by heating together manganous oxide and alumina in the electric furnace, and purifying the fused mass thus obtained by prolonged treatment with boiling hydrochloric acid. The insoluble residue, consisting of a mixture of manganese aluminate and a little graphite is finally purified by suspension in methylene iodide, when the different specific gravity of the two bodies allows of their ready separation. Manganese aluminate is perfectly stable in the air at normal temperatures, but is readily but superficially oxidized on heating. Although it is insoluble in HCl, it is readily attacked by $HNO_3$, HF and $H_2SO_4$. It is decomposed by oxidizing agents as well as by alkalies and alkaline carbonates.—Pharm. Journ., Jan. 17, 1903, 62; from Comptes rend., *135*, 963.

*Manganese Silicides—Preparation and Properties.*—Availing himself of the ease with which copper silicate gives up its silicon to other metals, Lebeau prepared the two manganese silicides in a crystalline condition. For this purpose either an alloy of copper and manganese is heated in the electric furnace with silicon, or a mixture of potassium fluosilicate and $Mn_2O_4$ is reduced by means of metallic sodium in the presence of copper.

*The silicide $Mn_2Si$* thus prepared, forms very brilliant, prismatic crystals, which scratch glass, but not quartz.

*The silicide MnSi* may be obtained under employment of either of the processes mentioned by altering the respective amounts of manganese and silicon. This forms very brilliant, tetrahedral crystals, which are harder than those of $Mn_2Si$, scratching topaz, but not corundum.—Pharm. Journ., March 21, 1903, 418; from Compt. rend., *136*, 91.

*Manganic Metaphosphate—Research on Gmelin's Violet Modification.*—Respecting Gmelin's researches on the violet manganic metaphosphate, Laspeyre had obtained a dark-violet, syrupy mass soluble in water with a ruby-red color; this solution becoming decolorized if heated, and an insoluble greenish-gray powder being deposited. Ph. Barbier has now reported this experiment, and in the course of his researches, succeeded in preparing a new compound, the

*Ammoniacal Manganic Phosphate*, which is of a much bluer and darker violet color than Gmelin's product. He describes this preparation, to which he assigns the empirical formula $P_4O_{14}Mn_2(NH_4)_2$, and which may be considered to be an ammoniaco-manganic diortho-dimetaphosphate.—Chem. News, Jan. 2 and 9, 1903, 11 and 23; from Compt. rend., *135*, Nos. 23 and 24 (Dec. 8 and 15, 1903).

*Ammonio-Manganic Phosphate—A New Form.*—P. Barbier has obtained a new combination of phosphoric acid with ammonium and manganese, which differs from the reddish-violet phosphate of Gmelin, and to which he attributes the formula $(NH_4)_2Mn_2P_4O_{14}$. It is obtained by mixing together precipitated manganese dioxide, 1, and diammonium phosphate, 4, with sufficient water to make a paste. Heat is applied, at first gently, then of sufficient intensity to melt the ammonium salt. The mass gradually dries, and assumes a violet tint; it is then thoroughly moistened with sufficient phosphoric acid, and heating is continued with constant agitation, until the whole mixture acquires a fine violet color. After cooling, the residue is washed with cold water until the washings are free from phosphoric acid. The new compound is thus obtained as a pulverulent violet substance. It is regarded as ammonio-manganic dipyrophosphate.—Pharm. Journ., Feb. 14, 1903, 197; from Comptes rend., *135*, 1169.

## IRON.

*Iron Ores—Analytical Method of Separating Zinc and Alkaline Metals.*—H. C. Babbitt suggests the following method as applicable for the rapid determination of zinc and alkaline metals in the analysis of iron ores: Having the thoroughly oxidized sample in solution in the minimum amount of hydrochloric acid, transfer to a separating funnel, add ether, and shake well for about eight minutes. On standing, the lower solution will contain all the copper and zinc, together with a small amount of ferric chloride. Draw off the lower solution, precipitate the copper with $H_2S$, oxidize with bromine and precipitate the small amount of iron. The zinc may then be determined by any approved method. Lead, if present, is better removed as sulphate previous to making the ether separation. Separation of the alkaline metals and aluminum from large amounts of iron is made in the same manner. The method is both rapid and accurate, and avoids the excessive amount of salts which are always present when basic acetate or ammonia separations are made.—Journ. Amer. Chem. Soc., xxiv, 1211.

*Ferric Oxide—Solubility in Alcohol.*—A. Minet calls attention to a contamination of alcohol with ferric oxide to the amount of 1.10 to 1.25 Gm. per liter. The alcohol had been stored in an iron drum for a long period, and had a deep red dichroic appearance. It was rendered iron-free and fit for use by simply agitating with a little sodium bicarbonate. It existed in the solution in the form of the colloidal hydrate, $Fe_2O_3H_2O$.—Pharm. Journ., Nov. 1, 1902, 435; from Journ. de Pharm. Chim. (6), *16*, 209.

CHROMIUM.

*Chromium—Determination of Melting-Point.*—An accurate determination of the melting-point having not yet been made, Ernest A. Lewis made such a determination, using chromium of 99 per cent. purity and free from carbon and a previously standardized Le Chatelier pyrometer. The process was conducted as follows: A piece of chromium as big as a pea was put in a hole in a lump of quick lime, and the flame of a blowpipe fed with coal gas and oxygen was directed on it; when the chromium was melted, the thermo-junction of platinum and platinum-iridium was placed in it, and the point at which the spot of light of the galvanometer was stationary a few seconds was noted. In two experiments the figures obtained were 1510° and 1520° C.—the mean melting-point of chromium being therefore 1515° C.—Chem. News, July 11, 1902, 13.

*Chromic Chloride—Action of Ammonia and of Methylamine.*—W. R. Lang and C. M. Carson state that when *liquefied* ammonia acts on violet chromic chloride, a salmon-colored powder is produced, from which water extracts two distinct compounds, which are crystallizable, and have the composition $Cr_2Cl_6.12NH_3.2H_2O$, and $Cr_2Cl_6.10H_2O$ respectively; the first of these is yellow, the second has the color of cobalt nitrate. Both are completely decomposed at 180° C. By acting on the same chromic chloride with methylamine, W. R. Lang and E. H. Jolliffe obtained a pink powder, which is precipitated, and, owing to its ready solubility in water and the ease with which it is decomposed, is with difficulty obtained in crystals. In composition this pink compound corresponds to the formula $Cr_2Cl_6.10(CH_3.NH_2)$. At 100° C. it loses 2 mols. of ammonia, and at 120° C. it is completely decomposed into chromic oxide.—Pharm. Journ., June 20, 1903; from Proc. Chem. Society, *19*, 1147.

*Chlorosulphates of Chromium—Production and Properties.*—By acting upon chromium sulphate with hot hydrochloric acid, A. Recoura obtained an interesting compound of the halogen acid with the sulphate,

*Chlorosulphate of Chromium*, $Cr.SO_4.Cl.6H_2O$. This is easily produced in the following manner: To 50 Cc. of fuming hydrochloric acid brought to the boiling-point, add 60 Gm. of the violet sulphate of chromium, which dissolves immediately, giving a green liquid. Boil for a quarter of an hour, and let the solution stand. After the lapse of several days a mass of crystals is formed, which is drained as thoroughly as possible, and then

washed with a mixture of alcohol and acetone. Thus we obtain a green powder very soluble in water, and to which analysis gives the formula $Cr.SO_4.Cl.6H_2O$. Its most interesting property is that the chlorine it contains is not precipitated by nitrate of silver, while the whole of the sulphuric acid is precipitated immediately by chloride of barium. Furthermore, after a certain time, the solution of this body, which is green at first, changes to violet, and it is then no longer anything more than a *mixture* of the violet chloride and the violet sulphate. The author also describes a second salt, the

*Chlorosulphate of Chromium*, $Cr.SO_4.Cl.5H_2O$, which is formed from the preceding when it is kept at a temperature of 85° for some time, by losing 1 mol. of water. The very dilute solution of this new salt (1 mol. in 500 liters), which previously was precipitated by chloride of barium, no longer has that property, all other conditions being the same. Neither is it precipitated by nitrate of silver. Thus the loss of 1 molecule of water has the effect of making the sulphuric acid enter the complex radicle which already contains the chlorine and the chromium. If the heating is continued at 85°, this compound continues to lose water and becomes more difcultly soluble, but at the same time it loses a little hydrochloric acid. The solutions of this second salt are rapidly changed, so that after 20 minutes the salt with $6H_2O$ is reformed.—Chem. News, Feb. 13, 1903, 75; from Bull. Soc. Chim. (3), *27*, No. 23.

## COBALT AND NICKEL.

*Cobalt and Nickel—Modification of Rose's Method of Separation.*—R. and L. Taylor find that a modification of Rose's method of separating cobalt and nickel gives very satisfactory results for both qualitative and quantitative work. It is rapid and less troublesome than the ordinary methods of separation. The mixed sulphides of cobalt and nickel are dissolved in the usual way in dilute hydrochloric acid, with the aid of a crystal of potassium chlorate. The liquid is then boiled down just to dryness to remove free acid. The residue is taken up with water and precipitated barium or calcium carbonate and bromine water added. It is now allowed to stand for five minutes, with frequent shaking. If cobalt is present, a black precipitate quickly appears. At the end of five minutes the liquid is filtered, and the filtrate tested for nickel by the addition of a drop or two of ammonia and ammonium sulphide. The presence of cobalt in the precipitate may be confirmed by the borax bead test. In this way nickel may be detected even when present in very small quantity, and when the cobalt is largely in excess. Instead of boiling off the free acid it may be neutralized with sodium or potassium hydrate before adding barium carbonate and bromine water; or the carbonate may be added in excess to the acid liquid, and then the liquid boiled for a short time to expel the free carbon dioxide. It must then be cooled to the ordinary temperature before add-

ing the bromine water.—Pharm. Journ., July 26, 1902, 83; from Chem. News, *85*, 269.

*Cobalt Silicide—A New Form.*—P. Lebeau finds that cobalt, like iron forms three silicides, $Co_2Si$, CoSi and $CoSi_2$. The first two have been known for some time, but the last has only recently been isolated by the author. It is obtained by heating a mixture of copper silicide, pure silicon and cobalt, in the electric furnace. The metallic button thus obtained is comminuted and treated alternately with nitric acid and with caustic soda. Since the residue of this treatment still contains a little CoSi as an impurity, it is digested in diluted HCl, on the water-bath, when the CoSi is dissolved, and the $CoSi_2$ left insoluble. It occurs in small, dark crystals, with a bluish refringence. It is not attacked in the cold either by fluorine or by chlorine or the other haloid elements, but unites with them at higher temperatures. Concentrated HCl is almost without action, even at a boiling temperature; HF, however, completely dissolves it in a few minutes. Dilute fixed alkalies are without action on $CoSi_2$, but react more markedly as they become more concentrated. Intense reaction takes place between the alkaline hydrates in a state of fusion and $CoSi_2$. In the nature of its compounds with silicon, as well as in the behavior of those bodies, cobalt is in close analogy with iron.—Pharm. Journ., Oct. 11, 1902, 367; from Comptes rend., *135*, 475.

## COPPER.

*Yellow Sub-Oxide of Copper—Preparation.*—Max Groger prepares the yellow sub-oxide of copper in the following manner: Ten Gm. of pure, dry cuprous chloride and 50 Gm. of pure sodic chloride are dissolved in 250 Cc. of warm, boiled water; then pour this mixture, drop by drop, by means of a funnel and a tap, stirring vigorously all the while, into a solution in a vessel of 600 Cc. capacity, consisting of 10 Gm. of caustic soda, 10 Gm. of Seignette salt and 150 Cc. water. The vessel is filled completely with water, stoppered with an india-rubber stopper, and well shaken up with the help of a machine. In this manner a bright, orange-yellow powder is obtained, which must be washed with a solution of Seignette salt until the filtrate no longer contains a trace of sodic chloride, then with cooled boiled water. The precipitate is dried on a porous plate, then at the ordinary temperature in the air. The precipitate then has a brownish, orange-yellow color. It is not a true hydrated protoxide, but a cuprous oxide retaining a small quantity of water. The author found variable quantities of water, from 2.54 to 0.95 per cent. This yellow sub-oxide remains unchanged, when it is dry, in contact with air; when in contact with water, oxidation only takes place with difficulty, and probably this is only due to the presence of a trace of alkali. This trace of alkali would have the effect of dissolving a small quantity of the sub-oxide, which, in contact with the air, is transformed into hydrated cupric oxide. The solution of Seignette salt

reacts on the sub-oxide in contact with the air, giving a blue solution. The crystallized red sub-oxide of copper, obtained by precipitation from Fehling's Solution by means of dextrose, is also transformed into the black cupric hydrate on contact with dilute soda solution in the presence of air; but this transformation is much slower than in the case of the yellow sub-oxide. These two modifications are comparable, through their properties, with the two oxides of mercury, the red and the yellow.—Chem. News, April 9, 1903, 179; from Zeit. Anorg. Ch., vol. xxxi, 326.

*Cuprous Chloride—Effect of Solvents.*—G. Bodlaender and O. Storbeck find that cuprous chloride, on contact with water, undergoes a decomposition which gives rise on the one hand to hydrochloric acid and suboxide of copper, and on the other hand especially to cupric chloride, with a deposition of metallic copper. This decomposition is retarded by the successive addition of chlorides; a solution containing more than 0.05 molecule of KCl per liter dissolves cuprous chloride without decomposition. In aqueous solution, cuprous chloride is decomposed partially in the form of complex ions. Solutions of chloride of potassium containing 0.05 to 0.4 molecule of the salt per liter dissolve cuprous chloride, with the formation of the compound $CuCl_2K$, while with more concentrated solutions the formula of the complex salt is $CuCl_3K_2$. The molecule of the complex cuprous salts contains certainly only one atom of copper, but the authors have not yet been able to determine definitely whether the cuprous ions were mono- or di-atomic. During the course of their research the authors have determined a few solubilities. The solubility of cuprous chloride in pure water = 2.851 millimolecules of Cu per liter at about 20°; the solubility in a concentrated solution of KCl, at about 16–20°, is as follows: One liter of solution of KCl at 0.05, 0.01, 0.2, 1.0 and 2.0 Gm.-molecules dissolve 0.002411, 0.004702, 0.009458, 0.0970 and 0.3840 Gm.-atoms of copper. The total quantity of copper dissolved in the state of cuprous chloride by solution of cupric sulphate ($SO_4Cu$) depends on the concentration of the latter solution increasing in proportion of the cupric sulphate present.—Chem. News, May 22, 1903, 251; from Ztschr. Anorg. Chem., *31*, 1.

*Cuprous Sulphate—Non-Existence in the Free State.*—In a previous paper A. Joannis described a compound of carbonic oxide and cuprous sulphate in solution which has the curious property of dissociating and giving cupric sulphate and particles of metallic copper on the surface of the solution. This substance, which apparently has the formula $SO_4Cu_2.2CO.H_2O$, decomposes in a vacuum, whether solid or dissolved, and the present experiments seem to show that cuprous sulphate cannot exist in the free state.—Chem. News, April 3, 1903, 168; from Compt. rend., *136*, No. 10 (March 9, 1902).

*Cupric Chloride and Bromide—Action of Sulphuric Acid.*—Georges

Viard has investigated the precipitates produced by the addition of sulphuric acid to a solution of

*Cupric Chloride.*—Bubbles of hydrochloric acid are given off, while the mixture becomes very hot, but the amount of chloride decomposed is very slight, and nearly all the dissolved salt is precipitated in the form of brownish-yellow, anhydrous chloride. When the sulphuric acid is not in sufficient excess, the green hydrated chloride, $CuCl_2 + 2H_2O$, is precipitated. More than 68.4 per cent. of its weight of sulphuric acid must be added for the anhydrous chloride to be formed. This anhydrous chloride appears as very small yellow crystals under the microscope; by allowing the green solution of $CuCl_2$ in $H_2SO_4$ to cool slowly, much more voluminous, arborescent crystals are deposited. An excess of sulphuric acid precipitates

*Cupric Bromide* from its solution, but the precipitate always consists of the black, anhydrous bromide. The reaction is much more sensitive than with the chloride, a solution of $\frac{1}{200}$ $CuBr_2$ with an excess of sulphuric acid gave an abundant black precipitate. The difference of solubility of the chloride and the bromide in sulphuric acid furnishes a ready means for distinguishing between these two salts. A mixture of 1 volume of sulphate of copper at $\frac{1}{10}$ with 10 volumes of $H_2SO_4$ is prepared in advance. By adding to this mixture a few drops of the salt to be tested a precipitate is formed; if yellow it is a chloride, if black it is a bromide. In this manner a solution of KCl at $\frac{1}{100}$, or of KBr at $\frac{1}{200}$ can be recognized.—Chem. News, April 24, 1903, 203; from Bull. Soc. Chim. (3), *27*, No. 20–21.

ZINC.

*Zinc—Method of Freeing it from Arsenic.*—Otto Hehner gives the following method for obtaining arsenic-free zinc: Melt about a pound or two of ordinary block zinc in a clay crucible over a good gas-fire. When quite fluid throw into the metal a piece of sodium, taking, for each pound of zinc, about 1 Gm. of sodium at a time. Stir the molten metal with a piece of hard-glass tubing bent at right angles. A black scum forms which is removed with a china spoon or a crucible lid held in the tongs. Stir vigorously, and remove the scum from time to time, till the sodium appears to have oxidized out. Then add more sodium and treat as before. Finally, pour out the metal into a second clay crucible, and repeat the sodium treatment once more. It is best to keep two crucibles marked with file cuts for the two stages. Allow the metal to cool considerably before granulating, as when zinc is very hot and fluid, heavy solid drops are obtained by granulation, whereas when near its solidifying point, thin flakes, presenting a large surface, are obtained. It is, of course, necessary to test the metal. It is well to either wash the granulated zinc with a little dilute hydrochloric acid, or pour the molten metal into very dilute acid. The molten metal must on no account be stirred with an iron rod, as all com-

mercial iron is arsenical.—Pharm. Journ., Aug. 2, 1902, 86; from Journ. Soc. Chem. Industry, *21*, 675.

CADMIUM.

*Cadmium Quadrantoxide—Preparation and Character.*—S. Tanatar's quadrantoxide of cadmium, $Cd_4O$, is prepared as follows: Cadmium oxalate is calcined at as low a temperature as posible in a current of dry carbonic acid, taking care to stir from time to time; the operation is stopped when no more gas comes off and the material allowed to cool in the carbonic acid. A beautiful, green powder remains, stable in dry air, oxidized slowly by cold water, and decomposed by acids or by ammonia into metallic cadmium and CdO. Its formula is $Cd_4O$, and its density at 19° is 8.177–8.207. If heated too strongly during its preparation, a yellowish-brown powder is obtained, which is a mixture of the metal and the protoxide.—Chem. News, Oct. 31, 1902, 222; from Ztschr. anorg. Chem., *27*, 432.

URANIUM.

*Uranium Subchloride—Characters and Chemical Relations.*—F. Mylius and R. Dietz have investigated the character of uranium subchloride. Its solution, obtained by dissolving uranic acid in hydrochloric acid, after concentration on the water-bath and remaining in the desiccator, gives yellowish-green prisms, which are fluorescent, very deliquescent and soluble in water, alcohol and ether (1 portion in 0.134 part of water at 18°); the saturated aqueous solution is syrupy and denser than glass (D=2.74). The salt is the hydrate $UO_2Cl_2+3H_2O$; its solutions have an acid reaction. If concentrated at 100°, hydrochloric acid is given off, with partial hydrolysis, and on cooling the syrupy liquid, very small citron-yellow needles, non-deliquescent, very soluble in water, less soluble in alcohol than the original salt, and having a slightly acid reaction, are obtained. This new salt is $UO_3.HCl+2H_2O$ or $UO_2.OH.Cl+2H_2O$; it can be be compared to $SO_2.OH.Cl$ with regard to $SO_2.Cl_2$, and may be called

*Chlorouranic Acid.*—Pure water, however, does not hydrolize it, but this result is attained by $NO_3Ag$, which precipitates the whole of the chlorine from the solution; the filtered liquid is yellow and astringent, it precipitates albumin, and its reaction is very slightly acid. An excess of the silver salt must not be used. In this manner a soluble, colloidal uranic acid is obtained, which is fairly stable at 0°, but at the ordinary temperature deposits, in a few days, a yellow body which is $UO_4H_2 + H_2O$ or $UO_5H_4$, or again, $UO_2(OH)_4$, orthouranic acid.—Chem. News, Nov. 21, 1902, 257; from Berichte, *34*, 2774.

*Uranous Oxide—Preparation from Uranyl Bromide and Characters.*—If *uranyl chloride* is calcined in the air, it loses its chlorine and is transformed into a green oxide—$UO_2Cl_2 = UO_2 + 2Cl$; then $3UO_2 + 2O = U_3O_8$. Oechsner de Coninck has repeated this experiment with *uranyl bromide*,

and has established the fact that, even by prolonged calcination, similar changes do not take place. Uranyl bromide loses all its bromine, and the radicle $UO_2$ remains in the form of a brick-red mass, which is stable even at high temperatures. When reduced in a current of pure hydrogen this oxide loses traces of water, and is little by little transformed into the black modification. The author therefore concludes: (1) that the uranous oxide when combined with bromine is first transformed into a brick-red modification and then to a black variety; (2) that uranous oxide which exists in uranyl chloride in the state of a radicle is different, in that it is less stable and is transformed into the green oxide by the action of heat. During the calcination of uranyl bromide the evolution of bromine is very exact and allows of an experimental verification of the molecular weight of uranous oxide and the atomic weight of bromine.—Chem. News, Dec. 19, 1902, 305; from Compt. rend., *135*, No. 21 (Nov. 24, 1902).

LEAD.

*Lead—Radio-Activity.*—F. Giesel has isolated from the mother liquors of barium radio-bromide, a strongly radio-active substance. Chemically this substance behaves as lead, and he considers it probable that it is ordinary lead, the radio-activity of which is induced through radium. He furthermore contradicts the statement of Hoffman and Strauss, that they first discovered the existence of a radio-active body closely related to lead. On the other hand, Demarçay, on examining this body under the spectroscope, found no radium lines, but two lines which could not with certainty be attributed to any known element, and which he thinks are possibly due to a body causing the radio-activity.—Pharm. Journ., July 26, 1902, 66; from Berichte, *35*, 102–105.

*Lead Sub-Oxide—Preparation, Composition and Properties.*—S. Tanatar has subjected the lead sub-oxide, obtained by Boussingault by the calcination of lead oxalate, to examination. The product formed always contains more lead than it should according to the formula, $Pb_2O$; this is no doubt due to the reducing action of the atmosphere of carbonic oxide. But if the operation is carried out in a current of carbonic acid, at a well-regulated temperature as low as possible, a fine grayish-black powder is obtained, unaltered in dry air, insoluble in and unchanged by water, but decomposed by heat, or by alkalies and acids, into metallic lead and PbO. On analysis the material gives 47.72–48.90 per cent. of lead (calculated for $Pb_2O$, 48.14 per cent.). The calorimetric examination of the attack with acetic acid, and that of its density, viz., 8.342, shows that the product is a true lead sub-oxide, $Pb_2O$, and not simply a mixture of Pb and PbO. If during its preparation the desired temperature is exceeded, a grayish-green powder is obtained which consists of Pb + PbO.—Chem. News, Aug. 15, 1902, 75; from Ztschr. Anorg. Ch., *27*, 304.

*Lead Sub-Oxide—Preparation and Character of the True Compound.*

R. W. E. MacIvor, having prepared some lead suboxide by the method of Dulong, Boussingault, and Pelouze, viz., carefully heating lead oxalate in a retort from which air is excluded, found the product invariably contained a greater proportion of lead than theory required for the suboxide. Thus, in four different specimens, the lead ranged from 96.98 to 98.36 per cent., theory demanding 96.28 (Pb = 207). Those irregularities in composition were undoubtedly due to the reduction of suboxide by carbon monoxide in the atmosphere of the retort. Pelouze states that the oxalate should not be heated to a higher temperature than 300°, the heat being continued as long as any gas is given off. He found the gas thus evolved to consist of a mixture of CO and $CO_2$ in the proportions of one to three, excepting towards the operation, when, particularly if "the heat be somewhat increased in order to finish the decomposition, the gas is richer in $CO_2$." This increase in the proportion of $CO_2$ can, of course, only arise from the reduction of $Pb_2O$. The author finds that if a heated current of pure carbon dioxide be maintained through the retort during the decomposition of the lead oxalate so as to rapidly remove the CO, immediately it is formed, and the temperature not allowed to exceed 300°, but kept rather a little under that point if anything, the final product is true suboxide free from PbO and metallic lead. It is a dull black powder tinged with grey, which bears lengthened exposure to dry air without undergoing change. Heated strongly—350° or so—it alters in color to greenish grey, being split up into Pb and PbO. It is not decomposed by water, but is acted upon by dilute alkalies and acids, and resolved into metal and PbO.—Chem. News, Oct. 17, 1892, 192.

*Lead Salts—Volumetric Determination*—R. C. Cowley and J. P. Catford observe that the published processes for the volumetric determination of lead salts are admittedly less accurate than gravimetric processes. The inaccuracy is further increased by the difficulty in perceiving the end of the reaction when titrated directly with either sulphuric or oxalic acid. Other methods are still more troublesome. Hempel's method, also, does not give satisfactory results owing to several causes, but when modified and carried out as follows, direct titration of the lead as oxalate is perfectly satisfactory and simple: The lead is precipitated by $\frac{N}{10}$ oxalic acid, in excess, transferred to a filter, washed and titrated direct with permanganate and sulphuric acid. There is no necessity for dissolving in nitric acid and sodium acetate; in fact the addition of alkali, either then or in the first part of the operation, is the reverse of advantageous. If the precipitation is performed without heat, the filtrate plus the washings can be used to determine the quantity of acid in the lead compound—an important point, in Goulard's Extract, for example, to prove that the acetate is completely converted into the basic compound, which the B. P. test does not do.—Trans. Brit. Pharm. Conf. 1902, 501–504.

*Halogen Lead Salts—Solubility.*—D. M. Lichty has determined the solu-

bility in water of the chloride, bromide and iodide of lead at various temperatures between 0° and 100°. He finds that of the first-named salt 0.6728 Gm. may be dissolved in 100 Cc. of water at 0°, 0.9070 Gm. at 15°, and 3.208 Gm. at 100°. Lead bromide is less soluble than the chloride below 35°, above which it is more soluble. Thus at 15°, 100 Cc. of a saturated solution contains 0.7285 Gm. of lead bromide, and 100° 4.550 Gm. may be dissolved. Lead iodide is, of course, less soluble than either of the other salts. At 15°, 0.0613 Gm., and at 100°, 0.420 Gm., may be dissolved in 100 Cc. of water.—Jour. Amer. Chem. Soc., *25*, 469.

*Periodates of Lead and Copper—Conditions of Formation and Characters.*—F. Giolitti has studied the conditions under which the different periodates of lead and of copper are produced. Of the

*Periodates of Lead*, the compound $PbHIO_5$, is obtained as a white precipitate when a solution of lead acetate, acidulated with acetic acid, is treated with dipotassic iodate, $K_2HIO_5$. When dried it turns slightly yellow, and becomes crystalline. At 140° it loses water, and changes to $Pb_2I_2O_9$, an orange-yellow powder insoluble in water. In two experiments, and without the author having been able to determine the difference of the conditions, a yellow precipitate of $Pb_3I_2O_{10}.2H_2O$ was obtained instead of $PbHIO_5$. On the other hand, freshly-precipitated $PbHIO_5$ gives, on boiling with acetate of lead, an orange-yellow powder of $Pb_3I_2O_{10}.PbHIO_5.H_2O$.—This salt is obtained by precipitating acetate of lead by an aqueous solution of periodic acid; it is a white powder, losing $H_2O$ at 110°. $Pb_2HIO_6$.—$PbHIO_5$ submitted to prolonged boiling in water, gives this salt in the form of a brown crystalline powder. $Pb_3I_2O_{10}H_2O$.—A solution of $PbHIO_5$ in nitric acid is treated with the freshly precipitated hydrated lead; it is a white crystalline powder. Of the

*Periodates of Copper*, the compound $CuHIO_6$, is a green powder, obtained by precipitating a solution of acetate of copper by $K_2HIO_5$; it loses water at 120°, and forms the salt $Cu_4I_2O_{11}$, which is a brown powder. $Cu(IO_4)_2$.—A sky-blue precipitate obtained by boiling acetate of copper with periodic acid. $Cu_5I_2O_{12}.7H_2O$ is a dark-green precipitate obtained by boiling the precipitate formed by $K_2HIO_5$ and a large excess of acetate of copper, in ammonia. The hydrate, $Cu_5I_2O_{12}.3H_2O$, is obtained in the form of a yellowish-green powder by dissolving $Cu_2HIO_6$ in nitric acid, then adding hydrated oxide of copper, and boiling the solution.—Chem. News, June 14, 1903, 287; from Gazz. Chim. Ital., xxxii (II.), 340.

### MOLYBDENUM.

*Molybdic Acid—Estimation by Reduction with Hydriodic Acid.*—F. A. Gooch and V. S. Pulman effect the estimation of molybdic acid by a method which consists in reducing it to the state of $Mo_2O_3$ by means of hydriodic acid. They treat 0.3 to 0.5 Gm. of molybdate with at least

20 Cc. of hydrochloric acid of 1.20 density, and 0.2 to 0.6 Gm. of potassic iodide in a vessel of 150 Cc. capacity, covering it with a clock-glass to prevent any loss. Heat to boiling until the original volume of the solution, 40–60 Cc., is reduced to 25 Cc., then dilute to 125 Cc., cool, and transfer to a Drechsel flask fitted laterally with a Will-Varrentrapp tube, which must be filled with a solution of potassic iodide. Then add 0.5 Gm. of sulphate of manganese and an excess of titrated solution of permanganate. Finally, run into the solution a known volume of a solution of arsenous acid. After adding a little tartaric acid, to prevent the precipitation of molybdenum, neutralize the excess of acid by means of bicarbonate of potassium, and titrate the excess of arsenous acid with a solution of iodine. The amount of permanganate used, lessened by the quantity of arsenous acid added, and increased by the volume of iodine solution used, gives the amount of molybdic acid present in the solution. The results obtained are very accurate.—Chem. News, April 9, 1903, 179; from Zeit. Anorg. Ch., xxix, 353.

## VANADIUM.

*Vanadium Silicide—Preparation and Properties.*—H. Moissan has obtained vanadium silicide, $VSi_2$, by heating a mixture of vanadic oxide with an excess of pure silicon, in the electric furnace, with a current of 1,000 amperes and 50 volts, passed for two minutes. The fused button thus obtained is treated with 10 per cent. solution of KOH on the water-bath, until no more gas is evolved; the crystalline residue is then extracted first with $HNO_3$, then with $H_2SO_4$. The treatment is repeated until nothing but pure $VSi_2$ remains mixed with a little graphite. This is separated by means of bromoform, on the surface of which the graphite floats, and may be easily removed. The compound may also be prepared by reducing a mixture of silicon and vanadic acid by ignition with magnesium dust. $VSi_2$ forms brilliant prisms of a metallic appearance. Its sp. gr. is 4.42; it scratches glass, and is fusible and volatile in the electric furnace. It is very stable, insoluble, and not attacked by acids, except hydrofluoric acid, which decomposes it in the cold. It is attacked by fluorine only at a red heat, when it combines, with incandescence. With chlorine it combines when heated with the emission of light, forming a mixture of $SiCl_4$ and $VCl_4$. The reaction with bromine is similar, $VBr_3$ being formed, and $Si_2Br_6$. The former is decomposed by water, forming $VO_2Br_3$. Iodine, oxygen, sulphur and $H_2S$ only react slightly on the silicide. Heated in gaseous HCl a colorless liquid silicium chloroform, $SiHCl_3$, boiling at 32° C., a sublimate of $VCl_2$, and a brown residue $VCl_3$ are formed. Prolonged fusion with KOH results in the ultimate total decomposition of $VSi_2$, gas being evolved, and a mixture of potassium vanadate and silicate resulting. —Pharm. Journ., Aug. 16, 1902, 128; from Comptes rend., *135*, 78.

*Vanadium Silicide—A New Form.*—In addition to the vanadium silicide,

$VSi_2$, above recorded, Moissan and Holt announce the synthesis of another silicide, having the composition $V_2Si$. It was obtained by heating together a mixture of vanadium oxide, silicon, and carbon in an electric furnace when the silicide is formed according to the equation—$2V_2O_3 + 2Si + 3C = 2V_2Si + 3CO_2$. It is also obtainable by heating, under like conditions, a mixture of a large excess of vanadium oxide or vanadic acid with silicon. As a greater part of the vanadium is volatilized by this method, the yield of $V_2Si$ is but small. Another method employed was to heat a mixture of vanadium oxide, silicon and copper in a carbon crucible in the electric furnace. The product thus obtained consisted of a solution of $V_2Si$ in a mixture of copper silicide and vanadium-copper amalgam. When cooled the button of the fused material was crushed and heated for several hours on the water-bath with 50 per cent. $HNO_3$. The alloy and copper silicide were thus destroyed, and the residue was treated with a boiling 10 per cent. solution of KOH. Finally the graphite present as an impurity was separated by means of suspension in bromoform. Thus obtained the $V_2Si$ is always contaminated with a small quantity of carborundum. The new silicide, $V_2Si$, occurs in prismatic silvery white crystals, with a metallic lustre, which readily scratch glass. Its sp. gr. is 5.48 at 17° C. It fuses at a higher temperature than $VSi_2$. It is insoluble in most solvents. It is not attacked by fluorine in the cold, but on slightly heating combination takes place, accompanied by a slight incandescence. At a red-heat chlorine combines with $VSi_2$, forming $VCl_4$ and $SiCl_4$; bromine under like conditions gives a black, amorphous sublimate of $VBr_4$ and a residue of $Si_2Br_6$. Iodine has but a superficial action on $VSi_2$. HCl, at about 800° C., unites with it to form a mass of minute shining reddish-brown crystals which are at once decomposed by water, giving a brown solution, which becomes greenish-blue on the addition of $HNO_3$. They are probably a double chloride of silicon and vanadium. $VSi_2$ is partially decomposed when heated in the electric furnace with excess of carbon, whereas $V_2Si$ is stable. When heated in molten silicon it melts, dissolves, and is completely converted into $VSi_2$.—Pharm. Journ., Nov. 1, 1902, 435; from Comptes Rend., *135*, 493.

### TITANIUM.

*Titanium Trichloride—A Serviceable Reducing Agent.*—Reflecting on the analogy between titanium and tin, it appeared likely to E. Knecht that the titanium tetrachloride on reduction would give the lower chloride, $TiCl_2$, analogous to stannous chloride, and that it might thus prove serviceable as a reducing agent. The reduction of the acid solution of the tetrachloride of titanium, however, produced the trichloride, already known, instead of the expected dichloride, but this, on examination, proved to possess remarkable reducing properties. Whilst applicable to reduction in a similar manner to stannous chloride, titanium trichloride is more powerful. Copper salts can be reduced to metallic copper; sulphites may

be quantitatively reduced to hyposulphites, or if the action be pushed, sulphur is produced. By careful neutralization with soda, the titanium can be completely removed as the hydrated oxide. The behavior of titanium trichloride towards organic substances is also of interest; nitro-bodies are reduced immediately to amines, and in the case of substances containing more than one nitro group, the partial reduction is readily effected. Azo-bodies are attacked so sharply that they may be quantitatively estimated, and other reactions are given showing the wide range of applicability of this reagent.—Pharm. Journ., Feb. 28, 1903; from Berichte, through Nature, *67*, 352.

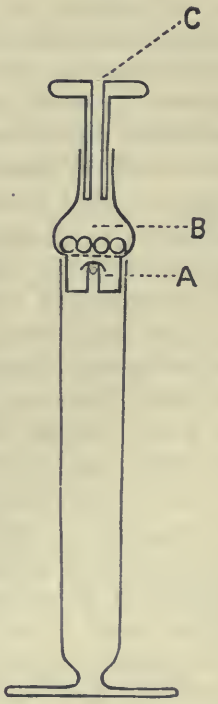
## TELLURIUM.

*Tellurium Tetrachloride—Characters.*—V. Lenher has obtained tellurium tetrachloride, $TeCl_4$, in the form of long needle-shaped crystals, by the action of sulphur monochloride on metallic tellurium, according to the equation $Te + 2S_2Cl_2 = TeCl_4 + 4S$. The free sulphur thus formed is dissolved in the excess of $S_2Cl_2$. $TeCl_4$ is insoluble in $S_2Cl_2$ and in $CS_2$, so that by washing with the latter liquid the crystals may be obtained pure. They are permanent in dry air but oxidize in the presence of moisture.—Jour. Amer. Chem. Soc., *24*, 188.

## ARSENIC.

*Arsenic—Apparatus for the Detection of Minute Traces.*—Edwin Dowzard describes an apparatus for the detection of minute traces of arsenic, which is shown by Fig. 60, in half actual size. Though as little as the $\frac{1}{20,000,000}$ of a gram can just be recognized, the $\frac{1}{1,000,000}$ gram may be taken as the practical limit. The apparatus is used as follows: A rod of pure zinc, 2 Cm. long and 5 Mm. in diameter, is placed for about half to one minute in boiling water containing about 5 per cent. pure HCl (sp. gr. 1.124); this is to remove any surface impurities. The rod is then washed in distilled water and placed in the apparatus. Two Cc. of HCl (sp. gr. 1.124), free from arsenic and containing 6 drops of a 15 per cent. solution of cuprous chloride in 100 Cc., is mixed with the substance to be tested, which must be in

FIG. 60.




A, Trap.
B, Scrubbing chamber containing beads.
C, Orifice, 3 m.m. in diameter.

Apparatus for the Detection of Minute Traces of Arsenic.

solution, and the liquid made up to 8 Cc. Before introducing the liquid, a piece of Swedish filter-paper, 3 Cm. square, is prepared as follows: A ring about 12 Mm. in diameter is drawn with a graphite pencil in the centre of paper, which is then moistened inside the ring with 5 per cent. mercuric chloride solution and dried. The ring is drawn merely to show the position of the mercuric spot. The glass beads in the scrubbing chamber may be moistened with a solution of lead acetate or cuprous chloride; the trap underneath is to prevent any washing liquid from entering apparatus, or the scrubbing chamber may be filled with cotton-wool which has been saturated with a 5 per cent. solution of lead acetate, and dried. The mercuric chloride paper is now attached to the top of apparatus with a clip, so that the orifice is under the center of ring. The liquid to be tested is introduced into apparatus, which is placed in water at 60° C. (the water should be on the same level as the liquid inside apparatus). After thirty minutes the paper is removed and examined in full daylight; a minute trace is indicated by a lemon-yellow spot and a trace by a deep orange-brown spot. A blank test with the reagents must precede the examination. It is only necessary to test the same batch of acid and zinc occasionally. In the absence of organic matter this test is extremely delicate, but in the presence of such, they should be treated as follows:

*Solids.*—0.5 Gm. is made into a paste or strong solution with water, and mixed with 0.2 Gm. of pure calcium oxide free from arsenic; the mixture is then dried on an asbestos felt and ignited; this should be done in a small porcelain dish. The residue is mixed with a few Cc. of water, and HCl added drop by drop until solution is effected; this solution is then examined as described above.

*Liquids.*—Two Cc. is mixed with 0.1 Gm. of pure calcium oxide free from arsenic, and the mixture treated as in the case of solids.—Chem. News, July 4, 1902, 3.

*Arsenic—Presence in Algae and in Feathers.*—Gautier notes the presence of arsenic in *Algae* (which see) and also in feathers; but it is not universally present in the plumage of birds, being only found in certain portions, such, for instance, as the ventral down, or the display plumage of the male, which is directly connected with the sexual functions. Thus, the ventral down of the goose was found to contain 1.2 part per million of arsenic, while none was found in the larger feathers, nor in their shafts.—Pharm. Journ., Jan. 31, 1903, 126; from Compt. rend., *135*, 834.

*Arsenic—Occurrence in the Animal Organism.*—Gautier has found arsenic in various organs and parts of animals, particularly in those portions containing "keratin," on the bristles of the hog, feathers of geese, horns of oxen and the hair and nails of dogs. Furthermore, the arsenic content appears to be cumulative, particularly when accompanied by keratin, the various portions of older animals containing more arsenic than the

corresponding portions of the younger.—Amer. Jour. Pharm., Mar., 1903, 139; from Compt. rend., 1902, 1434.

*Arsenic—Retention by Animal Charcoal.* The statement made at a recent meeting of the Philadelphia section of the American Chemical Society, by the inventor of a water filter in which arsenical charcoal was used, that the salts of some metals, and even arsenic, as arsenous acid, could be in large part removed from aqueous solution passed through arsenical charcoal, induced Professor John Marshal and Leon A. Ryan to investigate the subject, the more particularly since some unpublished investigations made by Mr. Edward R. Noyes seemed to confirm the claim made by the inventor. The authors now communicate the results of two experiments, which confirm the claims of the inventor as well as the statement attributed to Mr. Noyes. In the one experiment, 64.30 per cent. of the arsenic was retained by the charcoal, in the other 39.02 per cent. Amer. Journ. Pharm., June, 1903, 251-253.

*Arsenic—Detection in Glycerin.*—J. Bougault detects the presence of arsenic in glycerin by means of the reagent of Engel and Bernand. That is prepared by dissolving sodium hypophosphite, 20 Gm., in water, 20 Cc., and adding pure hydrochloric acid, 200 Cc. A little NaCl crystallizes out and may be separated by straining through absorbent cotton wool. Five Cc. of the glycerin to be tested is treated with 10 Cc. of this reagent, then heated in boiling water; with 0.00005 Gm. of $As_2O_3$ a distinct brown tint is produced, which is evident with even 0.00001 Gm., and after standing some days is deposited as a visable precipitate.—Pharm. Journ., Aug. 2, 1902, 86; from Journ. Pharm. Chim., [6], *15*, 527.

*Arsenic Pentachloride—Preparation and Properties.*—C. Baskerville and H. H. Bennett have succeeded in preparing $AsCl_5$ by saturating pure $AsCl_3$ with chlorine at —35° C., boiling off the excess of chlorine at —31°, and again cooling to —35° C. It forms a greenish-yellow liquid readily soluble in carbon disulphide and in absolute ether cooled to —30° C. From the latter solution when chilled several degrees lower it crystallizes in yellow prisms. It loses chlorine when the temperature rises above —28° C. On exposure to the air it fumes, evolving HCl, and as the temperature rises forms crystals probably of $AsCl_3$. In a sealed tube it crystallizes in a crop of well-formed yellow crystals between —38° and —40° C.—Chem. News, Feb. 6, 1903, 165; from Journ. Amer. Chem. Soc., *24* (1902), 1070.

*Arsenic and Antimony Sulphides—Action of Hydrogen in the Presence of One in the Other.*—From his researches on the action of hydrogen on arsenic sulphides in the presence of antimony, and on antimony sulphide in the presence of arsenic, H. Pélabon finds that: (1) Antimony completely displaces the arsenic in arsenic sulphide if the two bodies are liquid; (2) hydrogen gas, when heated in presence of antimony sulphide and a mixture of arsenic and antimony, forms hydrogen sulphide (the

proportion of this latter gas increasing with the amount of arsenic in the preceding mixture) ; (3) the effect of the arsenic is to decidedly increase the value of the proportion R (the ratio between the partial pressure of the hydrogen sulphide and the total pressure of the gaseous mixture) ; at 625° with pure antimony sulphide and excess of antimony it is the constant number 0.568.—Chem. News, May 8, 1903, 226 ; from Compt. rend., *136*, No. 13 (March 30, 1903).

ANTIMONY.

*Antimony Hydride—Variation of Yield in Gaseous Form According to Source.*—A. Stock and W. Doht have studied the composition of the gas evolved from a series of alloys of antimony with zinc, sodium, calcium and magnesium, and found that the magnesium alloy was much the best for the purpose of preparing the pure hydride. Thus, while the zinc-antimony alloys never yielded a gas containing more than 1 per cent. of antimony hydride, an alloy of one part of antimony and two of magnesium gave hydrogen containing from 10.4 to 14 per cent. of the hydride. From this mixture the pure gas was easily solidified out with liquid air, melting at −88° C. and boiling at −17° C. The solid hydride melts to a clear liquid and evaporates without leaving any trace of antimony. The gas may be kept at the ordinary temperature for some hours before decomposition sets in.—Pharm. Journ., Aug. 2, 1902, 85 ; from Berichte, through Nature, *66*, 281.

*Antimony Pentachloride—Formation and Characters of Double Salts.*—R. F. Weinland and Fr. Schlegemilch state that similarly to $SnCl_4$, antimony perchloride easily forms chlorantimoniates ; however, the formulæ are more complicated since the salts formed are rather basic. One molecule of $SbCl_5$ and half a molecule of the other chloride are dissolved in a sufficient quantity of warm, 15 per cent. HCl ; the yellow liquid formed gives crystals of the double salt when cooled ; with magnesium and calcium the cooling must be considerable. The chlorantimoniates are of a pale greenish-yellow color, and are deliquescent with the exception of the ammonium salt ; they are decomposed by water, especially when heated, giving antimonic acid. When calcined they form $H_2O$,HCl and $SbCl_3$ ; the chloride and the antimoniate of the metal remain. The potassium salt has the formula $SbCl_5.SbCl_4(OH).2KCl$, and forms rhombic plates ; the ammonium salt has a similar formula and appearance. The calcium salt, $SbCl_5.SbCl_3OH.CaCl_2 + 9H_2O$, occurs in long prisms, and that of magnesium, $SbCl_5.SbCl_4OH.2MgCl_2 + 17H_2O$, in long prisms or plates.—Chem. News, Nov. 21, 1902, 257 ; from Berichte, *34*, 2633.

*Antimony Pentiodide—Non-Existence.*—In 1876, R. W. Emerson MacIvor had contradicted the statement previously made by Van der Espt, that antimony pentiodide, $SbI_5$, is formed when a mixture of the elements in the required proportions is carefully heated, or that such a compound

is obtainable by any other method. Subsequently Pendleton, however, stated that he had succeeded in forming the compound by fusing antimony with an excess of iodine in an atmosphere of inert gas in a sealed tube kept at a temperature above the fusing-point of the mixture for an hour or two, the excess of iodine being subsequently removed by heating the material at a temperature not exceeding 130° C. Mr. MacIvor has now again taken up the subject. He made a quantity of the supposed $SbI_5$ in the manner described by Pendleton and submitted it to careful examination, with results which confirm his previously-expressed conviction that antimony pentiodide does not exist, and that Pendleton's product is simply an intimate mixture of the tri-iodide and iodine. On analysis, it was found to contain 80.153 per cent. of iodine (126.9), theory for $SbI_5$ requiring 84.151; but after continuous heating for twelve hours at 125–130° in a slow current of dry carbon dioxide, this fell to 76.373 per cent.; theory for $SbI_3$ being 76.032. It dissolved in hot carbon disulphide, yielding a solution possessing the characteristic color imparted to that liquid by free iodine, and which, on cooling, deposited crystals of $SbI_3$ melting at 165°. By means of chloroform, in which the tri-iodide is only slightly soluble, he succeeded in completely dissolving out the free iodine from the substance, and obtained pure $SbI_3$. On being decomposed by water the material yielded yellow oxyiodide, hydriodic acid, and *much free iodine.* Chem. News, Nov. 7, 1902, 223–224.

BISMUTH.

*Bismuth Suboxide, BiO—Preparation and Characters.*—S. Tanatar has prepared bismuth suboxide, BiO, as follows: Bismuthyl oxalate is first prepared by digesting $Bi_2O_3$ with a warm solution containing a known calculated quantity of oxalic acid. The dried salt is calcined as gently as possible in a current of carbonic acid. There remains a black powder of the formula BiO, stable in air, slowly attacked by water, reducing Fehling's Solution, and permanganate when warmed. Density at 19° C. = 7.153—7.201. If heated too strongly, a gray powder is obtained, being a mixture of bismuth and $Bi_2O_3$. As for the oxalate of bismuth and bismuthyl, $(C_2O_4)Bi_2O$, it gives a mixture of the suboxide BiO and the metal. —Chem. News, Oct. 31, 1902, 217; from Ztschr. Anorg. Chem., *27*, 437.

*Bismuth Oxide—Action on Metallic Solutions.*—J. Alvy has observed that, on boiling recently precipitated bismuth oxide for one hour with solutions for ferric salts, the iron is only completely displaced in the case of weak solutions. With ferrous salts the bismuth displaces the iron from the chloride, even in the cold, but much more easily when boiled; it forms a greenish-white precipitate, easily oxidized, consisting of a mixture of basic salts or perhaps a mixed basic salt; the amorphous form of the precipitate renders it impossible to decide between those two hypotheses. As with iron, aluminum is completely displaced in very dilute solutions.

With manganese the displacement is partial. Copper is partially displaced from its concentrated solutions of the chloride, nitrate and sulphate, in the form of greenish-blue basic salts; in the case of the acetate the black hydrate is precipitated. The metals cobalt, nickel, lead, zinc and cadmium are also partially displaced from their solutions. The anhydrous oxide produces the same reactions, but much less readily than the precipitated oxide.—Pharm. Journ., Oct. 25, 1902, 412; from Bull. Soc. Chim. de Paris, *27*, 136.

MERCURY.

*Mercuric Oxide—New Wet Method of Preparation.*—According to R. Dufass a mercuric oxide which combines the good properties of both red and yellow oxides, without any of their disadvantages, is obtained as follows: 125 Gm. of potassium carbonate and 500 Gm. of water are heated to boiling, and a solution of 100 Gm. of mercuric chloride in 1875 Gm. of water is slowly added under continued boiling. The resultant precipitate, after washing and drying, is obtained as an orange-yellow crystalline powder.—Süddeut. Apoth. Ztg., 1902, 836; from Rép. de Pharm.

*Mercuric Oxides—Chemical Identity of the Yellow and Red Modifications.*—Experiments made by K. Schick lead him to the conclusion that Ostwald's view of the relationship of yellow and red mercuric oxides—that they differ simply in the size of the particles composing them—is the correct one, and that the older hypothesis, according to which the oxides are merely isomerides, is no longer tenable. Determinations of the solubility of the pure oxides in pure water at 25° C. show that they have practically the same solubility—yellow oxide = 1.19300; red oxide = 1.19500—the small difference being in all probability due to the difference in the size of the particles.—Pharm. Journ., Jan. 31, 1903, 125; from Ztschr. f. Phys. Chem., through Nature, *67*, 253.

*Calomel—Reaction with Sodium Bicarbonate.*— Theodore W. Schaefer, discussing the common practice of presenting calomel with sodium bicarbonate, the probable motives for effecting this combination, and the certainty of the incompatibility of the two substances, gives the results of some experiments undertaken with the object of determining the nature of the incompatibility. He finds that whenever dry calomel and dry sodium bicarbonate are mixed together at the ordinary temperature of the air, practically no chemical change occurs. If, however, some water be added to the mixture, though at first there is no apparent change, after a quarter or half hour the calomel loses its white color; it darkens quite perceptibly, and $CO_2$ is slowly evolved. Direct sunlight and warmth materially hasten the darkening process. On throwing this mixture upon a filter the clear alkaline liquid becomes at once colored dark brown or black on the addition of $H_2S$, demonstrating the indubitable presence of mercury in solution. The copper test shows quite distinctly the presence

of a soluble salt of mercury in the clear, filtered sodium-bicarbonate solution. It is therefore obvious, on chemical grounds, that sodium bicarbonate is not the proper vehicle with which calomel should be dispensed, because they both react upon each other in the presence of moisture, whereby a portion of mercury is rendered soluble.—Merck's Rep., Nov. 1902, 430.

*Ammoniated Mercury—Variation of Commercial Samples.*—C. Kollo has examined fourteen samples of ammoniated mercury and finds the proportion of mercury in them to vary from 72.99 to 79.09 per cent. He attributes this variation to the fact that the processes given in the various Pharmacopœias show differences in detail which are sufficient to account for the variability in the composition of the products. Only the British Pharmacopœia (which requires 78 to 79 per cent.) makes any statement as to the percentage of mercury obtainable from ammoniated mercury. The author recommends the process of the Ph. G., 4th edit., which closely resembles the B. P. process, except that the former directs the precipitate to be washed with a definite volume of water, and dried at 30° C., without exposure to light.—Pharm. Post, 1903, 53.

*Mercuric Iodides—Changes of Color at Different Temperatures.*—The experiments of D. Gernez show that the two varieties of mercuric iodide, when under the influence of refrigerating action, behave as if they were two different bodies, and the quadratic red iodide is not transformed into the orthorhombic yellow iodide. He also finds that these two colored varieties have clearer and clearer tints as they are cooled—a fact analogous to that recently discovered by M. Moissan with regard to fluorine and sulphur.—Chem. News, May 15, 1903, 237; from Compt. rend., *136*, No. 14 (April 6, 1903).

*Mercurous and Mercuric Carbonates—Question of Composition.*—Dr. Theodore W. Schaefer calls attention to the paucity of information in the text-books on chemistry concerning the mercurous and mercuric carbonates of mercury. Works on chemistry describe mercurous carbonate ($Hg_2CO_3$) as a normal salt, whilst mercuric carbonate (variously written, as $HgCO_3$, $HgCO_3 + 2HgO$ or $HgCO_3 + 3HgO$) is known as a basic or oxysalt. The author observes that there is no doubt that the two carbonates are in all probability basic or oxysalts, somewhat similar to the basic oxychlorides, nitrates or sulphates of mercury, for in the preparation of the carbonates of mercury from mercurous and mercuric nitrates the carbonates are very liable to be contaminated at the same time with basic salts when thrown down by solutions of sodium carbonate ($Na_2CO_3$) and sodium bicarbonate ($NaHCO_3$). By methods which must be consulted in the original, the author has obtained a

*Mercurous Carbonate* in the form of a yellow powder, which on heating, however, is easily decomposed; it turns dark, and is converted into mercurous oxide, mercuric oxide and metallic murcury with evolution of car-

bon dioxide. Simple exposure to the air also occasions its decomposition. Under certain conditions also what appears to be a

*Mercurous Oxycarbonate* is formed. On adding a solution of sodium or potassium bicarbonate to a solution of mercuric nitrate a yellowish-buff colored precipitate of

*Basic Mercuric Carbonate* is formed, which effervesces on the addition of acetic acid. This appears also to be very unstable. If the corresponding alkaline carbonates are used for the precipitation of the mercuric salt it seems probable that soluble double salts similar to those of mercury with haloid salts are produced. The subject needs further investigation, and promises, in the author's opinion, interesting results.—Drug. Circ., Oct., 1902, 202.

SILVER.

*Colloidal Silver—Non-Bactericidal Power.*—According to the investigations of E. Cohn, colloidal silver cannot be found in the blood forty-five minutes after its introduction into the blood stream. It is apparently precipitated in the various organs of the body, but these precipitates were found to be devoid of bactericidal power.—Centralbl. Bakter., 1902, 804, through Chem. Zeit. Rep., 1902, 331.

*Collargol—Nature and Composition.*—The investigations of Hanriot lead to the assumption that collargol, and probably other forms of colloidal silver, are not, as hitherto supposed, simply silver in the colloid form, but salts of a peculiar acid,

*Collargotic Acid.*—When a solution of collargol is submitted to electrolysis, the black deposit formed on the positive pole, which has hitherto been considered to be metallic silver, is found to be this acid. It dissolves in alkalies with a characteristic red color. When solutions of collargol are precipitated with silver nitrate, at the moment precipitation is complete no trace of silver is left in solution either as collargol or as nitrate. The precipitate, too, is not merely metallic silver. With ammonia it gives the characteristic red solution of collargol. If copper sulphate or barium nitrate be employed as precipitants, the precipitate obtained invariably contains traces of the respective salts. Other observers have noticed that it is impossible to obtain colloidal silver absolutely pure. Thus, Carey Lea has found 98.1 per cent. of silver to be the highest degree obtainable; when this is exceeded the result is ordinary metallic silver.—Pharm. Journ., May 16, 1903, 675; from Compt. rend., *136*, 680.

GOLD.

*Gold—Volumetric Determination with Thiosulphate.*—Factor recommends a volumetric method for the determination of gold, which is based on the fact that, while a neutral solution of gold gives with potassium iodide

a green precipitate of gold iodide, this precipitate is not formed if the iodide is added in excess, but a brown solution of $AuI_4K$, which, when titrated with $\frac{N}{10}$ thiosulphate, reacts according to the following equation: $AuI_4K + 2Na_2S_2O_3 = AuI_2K + 2NaI + Na_2S_4O_6$. In the experiment, 10 Cc. of gold salt solution, containing approximately 2 per cent. Au, is treated with 4 Gm. of KI dissolved in 100 Cc. of water, and titrated with $\frac{N}{10}$ $Na_2S_2O_3$, using starch solution as indicator.—Pharm. Journ., Jan. 31, 1903, 125; from Chem. Ztg. Rep., *26*, 200.

## PLATINUM.

*Platinum—Recrystallization the Cause of Brittleness.*—W. Rosenhain concludes that the brittleness induced in platinum foil and crucibles by prolonged exposure to a high temperature is due to recrystallization, the metal being in a condition of severe strain owing to the fact that it has been rolled at temperatures far below its "annealing" temperature, and the natural effect of exposure to a high temperature being to allow the metal to recrystallize. The same phenomenon occurs with zinc and cadmium, but there is a further action in the case of platinum, simple annealing or recrystallization, although it will completely alter the interior structure of the metal, not of itself altering the appearance of the surface, even in microscopic detail. In order to develop a surface-pattern corresponding to the changed internal structure, the surface of the metal must be etched after the recrystallization has taken place. The etching action appears to be caused by the gases of the flame used to heat the metal, and the temporary formation of a carbide may play a part in the process.—Pharm. Journ., Aug. 9, 1902, 105; from Chem. News, *86*, 49.

*Pentachloroplatinic Acid—Preparation and Properties.*—A. Miolatti and I. Bellucci have examined the bodies which result from the substitution of 1, 2, 3, etc., hydroxyl for an equal number of atoms of chlorine in chloroplatinic acid (hexachloroplatinic), $PtCl_6H_2$, and are at present at work on the first term of the series, *Pentachloroplatinic acid*, $PtCl_5(OH)H_2$, which is no other than the product $PtCl_4HCl.2H_2O$, prepared by Pigeon by heating chloroplatinic acid at 100° for two or three days in an exhausted tube containing a few fragments of potash. On repeating this experiment on a larger scale in an exhausted oven with a larger surface, and in which the potash could be renewed during the operation, they easily obtained Pigeon's product in the form of a reddish-brown mass, fusible on the water-bath, extremely deliquescent, and giving yellowish-brown, slightly cloudy solutions with a distinctly acid reaction. These solutions are not precipitated in the cold by ammonia, which is distinctive of $PtCl_6H_2$; with KCl or $NH_4Cl$ the ordinary chloroplatinates are obtained. Acidimetry and the study of the electric conductivity show that pentachloroplatinic acid is a dibasic acid, of which the authors have prepared a number of salts—the barium, silver, thallium and basic lead salt. The authors also describe

*Tetrabromoplatinic Acid*, $PtBr_4(OH)_2H_2$, a dibasic acid, of which the salts of silver, thallium, mercury and lead (basic) have been prepared, all of them being of a brown color. They furthermore find that

*Platinum Tetrabromide*, $PtBr_4$, must be considered the anhydride of tetrabromoplatinic acid, this opinion being supported by the examination of the tetrabromide from the point of view of acidimetry, electrical conductivity, and the action of the salts of the heavy metals. Platinic bromide is slightly soluble in water, and yields a light reddish-brown solution.—Chem. News, July 25, 1902, 48; from Ztschr. Anorg. Chem., *36*, 209 and 222.

IRIDIUM.

*Iridium Nitrite—Preparation and Character of its Double Salts.*—E. Leidié finds that the so-called double nitrites of iridium and potassium are not pure salts since, being prepared from potassium chloro-iridate or iridite they invariably contain potassium chloride as an impurity. The pure

*Iridium and Potassium Nitrite*, $Ir_2K_6(NO_2)_{12}$, is obtainable only by employing iridic sulphate, resulting from the solution of hydrated iridic sesquioxide in dilute $H_2SO_4$. This is warmed to about 80° C., and treated with a slight excess of potassium nitrite. On cooling, a white precipitate is thrown down; this is extracted with boiling water and filtered while boiling. On cooling, a white precipitate is thrown down, which is collected and dried at 100° C. It is quite distinct from the salt described by Gibbs, which was probably a chloronitrite, while that of Lang was a lake of variable composition. The

*Iridium and Sodium Nitrite* is found to have the formula attributed to it by Gibbs, $Ir_2Na_6(NO_2)_{12}2H_2O$ and to have properties attributed to it by that author. The

*Iridium and Ammonium Nitrite*, $Ir_2(NH_4)_6(NO_2)_{12}$ has been obtained by the author for the first time. It is obtained by decomposing the sodium salt with ammonium sulphate, when it forms a white precipitate.—Pharm. Journ., Aug. 23, 1902, 211; from Comptes rend., *134*, 1582.

# ORGANIC CHEMISTRY.

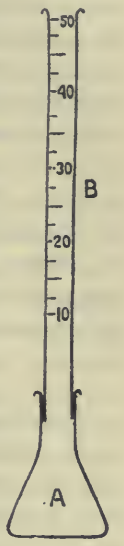
## HYDROCARBONS.

*Mineral Oil—Estimation in Admixtures with Vegetable Oils.*—R. F. Young and B. F. Baker submit the apparatus shown by Fig. 61 for rapidly and accurately determining the percentage of mineral oil in a mixture of such with vegetable oils. Into the flask A is ground an accurately gradu-

ated glass tube, holding about 60 Cc. of liquid and graduated to $\frac{1}{10}$ Cc. To use the apparatus, 50 Cc. of the oil under examination is measured into A, excess of alcoholic potash added, and the oil saponified by heating on the water-bath in the usual way with a reflux condenser or simply a long, glass tube, which may also be ground to fit A. When saponification is complete, the flask is fitted with B, and water added till the unsaponified oil rises into the graduated tube. The volume of oil is then read off, and its percentage easily calculated.—Chem. News, Aug. 1, 1902, 51.

*Paraffin—Use as a Protective Dressing.*—Karl Springer describes a new protective dressing, which is intended especially for use in plastic operations, skin grafting, etc., where it is important to keep the dressing from adhering to the surface of the wound. The various materials, such as rubber tissue, oiled silk, oiled gauze, etc., which are in general use for this purpose, are open to the objection that they stand sterilization by heat but once, after which they must be preserved in some antiseptic solution, which often impairs their strength or pliability, and always requires washing off in sterile water to remove before use. The substance which the author employs as a substitute is paraffin of a melting point of 45–47° C. If a small piece of this is thrown on the surface of boiling water it is first melted, and then, on cooling, forms a thin, floating pellicle, which may be handled with forceps and cut to the proper shape with scissors. The technique of its practical application is simple. A flat vessel provided with a cover is partially filled with water and brought to a boiling point. A piece of paraffin is then thrown in and the boiling continued for ten minutes. The vessel is then placed in another dish of cold water, causing the paraffin to harden as a thin pellicle on the surface. As soon as this occurs the vessel is placed in water at a little above body temperature, which keeps the pellicle soft and pliable. Holes for drainage may then be punctured through it with a sterile needle, and after cutting to shape it is lifted with forceps and applied to the wound with the water side down. The thickness may easily be controlled as experience dictates by the size of the lump of paraffin used.—Drug. Circ., Sept., 1902, 190; from Centralblatt f. Chirurgie.

Fig. 61.




*Dibromo-acetylene—Preparation.*—P. Lemoult prepares dibromo-acetylene from tribromethylene, the latter being easily obtained in quantity by the action of sodium ethylate upon symmetrical tetra-bromo-ethane. The tribromo-ethylene is heated with alcoholic potash in the absence of air, and the dibromo-acetylene collected under water. The distillation has to be carried out in a current of nitrogen, as the substance is spontaneously inflammable in air. Dibromo-acetylene cannot be distilled, even in a vacuum, and under certain conditions may explode violently. Bromine

and iodine give rise to $C_2Br_4$ and $C_2Br_2I_2$ respectively, and cautious treatment of the ethereal solution with moist air or oxygen gives rise to oxalic and hydrobromic acids. The first action would appear to be the addition of oxygen resulting in the formation of oxalyl bromide, which is then acted upon by the water present in the usual manner.—Pharm. Journ., June 27, 1903, 867; from Comp. rend., through Nature, *68*, 137.

*Beta-Naphthol—Delicate Test for the Detection of a-Naphthol.*—In view of the toxity of α-naphthol, H. Arzberger considers its detection in β-naphthol of importance, and recommends the following test, which is more delicate than the tests adopted in the various Pharmacopœias: Dissolve 0.3 Gm. of the sample in 2 to 3 Cc. of strong alcohol, add 10 to 15 Cc. of water, shake occasionally for about 10 minutes, and filter. To the clear filtrate add 10 to 12 drops of a 10 per cent. solution of potassium hydroxide and from 1 to 4 drops of solution of iodine (1 of iodine, 2 of potassium iodide, 60 of water), and shake gently. In the presence of α-naphthol a violet color is produced, while pure β-naphthol gives a yellowish color. An excess of iodine, if used, may be removed by a further addition of KOH solution.—Pharm. Post, 1902, 753.

*Naphthalene—A Constituent of Oil of Clove Stems.*—H. v. Soden and W. Rojahn have isolated naphthalene from the hydrocarbons of an oil of clove stems. This body has up to now not been detected as a constituent of an essential oil.—Pharm. Ztg., 1903, 779.

### VOLATILE OILS.

*Volatile Oils of the U. S. P., 1900.*—In continuation of his previous work (see Proceedings, 1902, 956), Prof. Edward Kremers reports in monthly instalments in the "Pharmaceutical Review" on the volatile oils that are to be admitted into the U. S. P., 1900, with the principal object of making his comments upon them the basis of wider discussion. The instalments published in the numbers of the journal named, from July, 1902, to July, 1903, embrace the following oils: Betulæ, gaultheriæ (Methyl salicylas), cadinum, cajuputi, cari, caryophylli, chenopodii, cinnamomi, copaibæ, coriandri, cubebæ, erigerontis, foeniculi, camphorae (Camphora monobromata), eucalyptol, menthol, safrol, thymol.

*Essential oils—Difficulties of Determining Genuineness and Quality by Pharmacists.*—In two papers read at pharmaceutical meetings of the Philadelphia College of Pharmacy, M. I. Wilbert reviews the nature of the difficulties encountered in the identification of genuineness and quality of essential oils, and particularly by the pharmacist. He says that while it is true that the pharmacopœia gives descriptions of the physical properties, and usually also chemical tests, for the identification of the different oils, it is quite possible for almost any one of these oils to conform to a number of the pharmacopœial requirements and still be adulterated or debased to a very considerable degree. To be positive of the genuineness or

purity of almost any one of the essential oils, it would be necessary that the pharmacist be a specialist in this particular branch of chemistry, and have at his command intricate and expensive pieces of apparatus for determining the specific gravity, boiling point, congealing point, optical rotation and refraction of the oil, to say nothing of fractional distillation or the chemical determination of the different constituents by means of saponification, esterification, acetylization, or any one of the other procedures that have been devised for separating, or recognizing the nature of the various compounds of which essential oils are composed. In consequence, the practical pharmacist is largely if not entirely at the mercy of the dealer or manufacturer, and certainly more so than with any other class of compounds. Drawing largely upon the semi-annual report of Schimmel & Co., of Leipzig, the author reviews the ascertained facts concerning the following oils: Bitter almonds, cinnamon, cloves, eucalyptus, juniper berries, lavender, mustard, peppermint, rose, rosemary, sandalwood, wintergreen, bergamot, lemon, lime, neroli, orange, anise, caraway, coriander and fennel. Preliminarily he calls attention to the

*Synthetic Volatile Oils*, and to the products and imitations that promise to play a very important part in future discussions on essential oils. These should not be confounded, however, with the "compounded oils"—the mixtures, blends or compounds with which the market is flooded at the present time; for these compounded oils are adulterations pure and simple, and while labeled correctly by the manufacturer or wholesale dealer, are willingly and knowingly sold to deceive. The synthetic oils, products and imitations under the above limitation are the direct outcome of original chemical investigation; the chemical constituents of the active, or at least the most important ingredients of a number of essential oils. Some of these constituents have been reproduced synthetically from other products much more economically, and in several cases more uniform in composition, than the natural products. These synthetics, and certainly the active constituents of the essential oils, representing the most desirable portion from a medical point of view, will doubtless be preferred to the natural oils themselves in the near future. Indeed, the recent edition of the Swedish Pharmacopœia, following the lead of the German, has gone further than the latter, and has adopted *anethol*, *carvone*, *eucalyptol*, *eugenol* and *cinnamic aldehyde* as representing the active constituents of the respective oils from which they are derived.—Amer. Journ. Pharm., April and May, 1903, 155–166, and 218–225.

*The Sesquiterpenes—Investigation.*—Introducing the subject of the sesquiterpenes in a scholarly thesis submitted for the Doctor's degree at the University of Wisconsin, Oswald Schreiner mentions that the group of hydrocarbons, designated by the generic word terpenes, are classified according to the value of X in the general formula $(C_5H_8)_x$, into: Hemiterpenes, $C_5H_8$; terpenes proper, $C_{10}H_{16}$; *sesquiterpenes*, $C_{15}H_{24}$; diter-

penes, $C_{20}H_{32}$, and higher, polyterpenes. While the terpenes have been so well characterized that the determination of their different modifications offers no particular difficulty, the sesquiterpenes, until a very recent date, have resisted investigation along parallel lines. The conditions for the study of the hydrocarbons of the formula $C_{15}H_{24}$ are exceedingly unfavorable. The sesquiterpenes are thick, easily-resinified liquids, with boiling points between 250° and 280° C.; in short, their properties are such that they do not invite investigation. In 1887, Wallach declared his intention to study the sesquiterpenes along lines parallel to those which had proven so successful in the investigation of terpenes; but, after reporting on cadinene, and later on the sesquiterpene of oil of cloves and copaiba balsam, giving it the name caryophyllene, and on several other sesquiterpenes not characterized, he (in 1894) signified his intention of desisting in their further investigation on the ground of apparently unsurmountable difficulties. Since then, results obtained by Chapman with the nitroso derivatives of humulene, by the author, by Charlotte F. James and by Edward Kremers in a series of investigations reported under the title "The Characterization and Classification of the Sesquiterpenes," have shown that the field of the sesquiterpenes is not so discouraging as Wallach had supposed. By the modification of old methods, or the application of new ones, gratifying results have been obtained; in fact, the outlook has assumed rather encouraging aspects. It is beyond the scope of this report to follow the author's very exhaustive treatise in detail, but the following, concerning the occurrence of sesquiterpenes in the vegetable kingdom, may properly find place here:

The sesquiterpenes are usually found in volatile oils as such, or in the form of sesquiterpene hydrates, alcohols belonging to the so-called camphor group. These hydrates, by dehydration, give rise to sesquiterpenes which are rarely identical with a natural sesquiterpene, being more often distinctive compounds. Many oils, such as cedarwood, santalwood, copaiba balsam, gurjun balsam, ginger, cubeb, etc., consist principally of a sesquiterpene or a sesquiterpene hydrate. The latter compound is found more often in the oils distilled from old drugs, and thus appears to be produced from the sesquiterpene during the aging process, although the exact conditions for this change are not known. In other oils the sesquiterpene is present in almost insignificant quantities only. The occurrence of the sesquiterpenes in the vegetable kingdom is given in a tabulated form, the arrangement being that of Engler's syllabus of plant classification. Such a tabulation shows that the sesquiterpenes are very widely distributed as products of plant life. The list includes thirty families, comprising fifty-six genera and upward of sixty-nine known species. The number of volatile oils in which sesquiterpenes have been found is upward of seventy-four, some of these being obtained from unknown botanical sources. The lack of characterization of the sesquiterpenes makes it

impossible to draw any general conclusions, but a few interesting facts are nevertheless brought out by such a tabulation. In the pine family, for instance, the sesquiterpene cadinene is restricted to the needles. Again, two distinct sesquiterpenes may occur in different parts of the same plant, as in the case of *Juniperus Virginiana*, where cadinene occurs in the leaves and cedrene in the wood. It is also interesting to note that closely allied species may contain different sesquiterpenes, thus, for instance, *Piper nigrum* contains caryophyllene, and *Piper Betel* and *Piper Cubeba* contain cadinene. Such an arrangement into families may often indicate relationships between the sesquiterpenes as well. Thus, for instance, the sesquiterpenes found in the pine family are all, with the exception of the cedrene from the wood of *Juniperus Virginiana*, cadinene. The close relationship between *Acorus Calamus* and *Acorus spuriosus* makes it probable that the same sesquiterpene is contained in both. A similar relationship might exist in the case of the *Copaifera* species, *Dipterocarpus* species and others, although no general conclusion of this nature can be drawn. A botanical relationship of this kind can merely indicate a possible chemical relationship of the sesquiterpenes contained in the plant, but this must in all cases be substantiated by a careful comparison of physical constants, and when possible by the preparation of characteristic derivatives. The following sesquiterpenes are described by the author, and in each case the plant oils in which they are found are mentioned: *Araliene*, *Atractylene*, *Bisabolene*, *Cadinene*, *Calamene*, *Caparrapene*. Of these, cadinene is the most widely distributed sesquiterpene, and has been the most closely studied.—Pharm. Arch., 1903, *6*, Nos. 2–6, 24, 33, 56, 65 and 81.

*Dual Odor of Flowers—Distinct Change During the Process of Maturing.*—J. O'Brien draws attention to the difference in the odor of *Odontoglossum hebraicum* as observed at different periods. When first flowered by him the blooms had a marked cinnamon odor, quite distinct from the hawthorn fragrance of other members of the group. On passing into other hands, the plant, when it first flowered, gave off the hawthorn odor, but on the next occasion of its blooming, the smell was that of cinnamon. The author does not state if these differences of odor have been traced to diverse periods of the blooming. It has been noticed by those who grow the common jasmin, that the flowers, when first expanded, possess in a marked degree the delicious fresh odor which is characteristic of them. But as flowering progresses, the perfume becomes less delicate, and the blooms are then very attractive to blue-bottle flies. This would appear to have some connection with the recorded formation of indol in the jasmin bloom as the process of flowering approaches completion.—Pharm. Journ., Aug. 23, 1902, 211; from Gardner's Chronicle.

*Flower Perfumes—Increase During the Enfleurage Process of Extraction.*—An interesting illustration of the actual production of the perfume of flowers during the process of enfleurage, as given by Albert Hesse, who

states that 1,000 kilos of tuberose blossoms only yielded 66 Gm. of oil when extracted with light petroleum, but during enfleurage yielded 801 Gm. of oil to the fat in which they were embedded, whilst a further 78 Gm. remained in the faded blossoms, and could be separated by extraction or distillation. It thus appears that eleven times as much perfume is produced during enfleurage as is originally present in the flowers, and that even after enfleurage the exhausted flowers contain more perfume than when first gathered.—Berichte, through Nature, *68*, 89.

*Perfumes—Manufacture in Mindanao.*—A very interesting description of the native method of manufacturing perfumes and of the peculiarities of their application is given by Geo. D. Rice. The paper is illustrated by a number of cuts showing the crude form of apparatus and utensils employed, but cannot be profitably abstracted.—Drug. Circ., Nov., 1902, 222.

*Lævo-Camphene—A New Constituent of Lemon Oil.*—In 1901, the chemists of the London Essence Company announced the discovery of pinene as one of the normal constituents of lemon oil, and also stated that another terpene was undoubtedly present, but the quantity they then had to deal with was not sufficient to admit of identification. They have since worked on much larger quantities, and have now confirmed their original opinion by isolating *l*-camphene in a tolerable state of purity. If it has the sp. gr. 0.869; opt. rotation (100 Mm.)—22°; ref. index 1.4770 at 18° C.; B. P. 164° C. at 759 Mm. pressure. From this they obtained by the usual reaction with glacial acetic acid and sulphuric acids iso-borneol M. P. 205° C. The pinene, which was stated in 1901 to be *l*-pinene, has since been found to be a nearly inactive mixture of the two modifications. —Chem. and Drug., Mar. 21. 1903, 476.

*Methyl Anthranilate—Quantitative Estimation in Volatile Oils.*—The method of E. Erdman (see Proceedings, 1902, 963) for the quantitative estimation of methyl anthranilate in volatile oils, which is based on the property of the ester of forming azo-dyestuffs, has been verified by A. Hesse and O. Zeitschel. Their examination has proved that Erdmann's method is not sufficient for the quantitative estimation of this body in essential oils, but that it gives satisfactory results if the anthranilic acid ester is present substantially or in an acid solution. The last-named authors therefore believe that it is more correct to adhere to the method mentioned by themselves, and in cases where methyl anthranilate as well as methyl ester of methyl-anthranilic acid are to be estimated, to combine the two methods.—Schimmel's Rep., Oct.–Nov., 1902, 58; from Berichte, *35*, 2355.

*Rectified Oil of Amber—Physical Constants.*—Very little being known of the physical constants of rectified oil of amber, Messrs. Schimmel & Co. (Report, Oct.–Nov., 1902, 8–9) give a short table exhibiting the properties of five different samples of oils rectified by them, which show

them to be identical in constitution. Obtaining the crude oil of amber direct from the producer, they are in a position to guarantee absolutely the purity of the oils examined, and, consequently, the reliability of the figures here given:

| $d_{15°}$ | $a_D$ | $n_{D20°}$ | Acid Number. | Ester Number. |
|---|---|---|---|---|
| 0,9281 | + 22° 32′ | 1,50820 | 6,5 | 8,95 |
| 0,9259 | + 24° 28′ | 1,50802 | 5,1 | 6,8 |
| 0,9277 | + 24° 36′ | 1,50957 | 5,78 | 3,85 |
| 0,926 | + 24° 40′ | 1,50857 | 5,09 | 4,37 |
| 0,9295 | + 26° | 1,51083 | 5,5 | 5,0 |

All these oils were soluble in 4 to 4.5 volumes of 95 per cent. alcohol.

*Chinese and Japanese Anise Oils—Chemical Examination.*—E. Tardy finds that the *Chinese Anise Oil* contains pinene, phellandrene, astragol, a dextrogyrate terpilenol, anethol, a levogyrate sesquiterpene, anisic aldehyde and acid, together with traces of a crystalline body of the formula $C_{20}H_{22}O_3$, and of the ethyl ether of hydroquinone. The author attaches some importance to the presence of the terpilenol, to which he considers the particular odor of Chinese anise is due. He has also subjected the *Japanese Anise Oil*, obtained from the fruits of *Illicium religiosum*, to a careful examination. The sample under examination was obtained by extracting the fruits with the ether, and subsequent purification by distillation. The oil had a low rotation $[a]_D = -1° 50'$. Aldehydes and ethers were proved to be absent. It is probable that a terpilene hydrocarbon is present, but owing to the small quantity available this could not be put beyond doubt. The presence of eucalyptol (cineol) and shikimol (safrol) has been proved. The author concludes that the presence of anethol cannot be definitely asserted, but he has been able to separate anisic acid, which, however, may be produced from astragol.—Pharm. Journ., Nov. 15, 1902, 491; from Bull. Soc. Chim. de Paris, *27*, 987 and 900.

*Anethol—New Oxidation Products.*—Joseph Bougault describes some new oxidation products of anethol and analogous bodies with propenyl side-chain. If to a 1 per cent. solution of anethol in 96 per cent. alcohol an excess of mercuric chloride is added, and then gradually a solution of about 1 per cent. iodine, the latter is immediately completely absorbed until .2 atoms iodine have been used up with one molecule anethol. The first superfluous drop then imparts a yellow color to the liquid. On this the author bases a method for the determination of anethol and similar bodies with propenyl side-chain. But it can only be employed in the absence of bodies with double linkage, phenol- or amine-character, as these also react with iodine. The determination is carried out as follows: To the alcoholic solution of anethol, diluted to about 1 to 2 per cent., there is added 10 Cc. of an alcoholic solution of mercuric chloride (containing 6 per cent.), after which a titrated iodine solution is added drop by drop

until the liquid is permanently colored yellow. 254 Gm. iodine correspond to 148 Gm. anethol. The reaction which occurs in this process is as follows: Iodine and mercuric chloride form in the first instance iodine chloride, which, under the influence of the water of the alcohol, next splits up into hydrochloric acid and hypoiodous acid. The latter then attaches itself to the double linkage of anethol. This view is supported by the fact that the same products are also formed when mercuric oxide and iodine are employed. An excess of mercuric oxide produces a body which shows all the properties of an aldehyde, and which possesses the formula $C_{10}H_{12}O_2$. The same body is also formed, when the addition-product obtained with mercuric chloride is submitted to further treatment with mercuric oxide.

Analogous bodies are produced from isosafrol, methyl isoeugenol and isoapiol.—Schimmel's Rep., April–May, 1903, 11–13; from the author's "Thesis."

*Oil of Asarum Arifolium—Characters and Chemical Components.*—Hitherto only the volatile oils of two species of *Asarum* have been subjected to chemical investigation, namely, that of the root of *Asarum Europæum*, a drug which has been used medicinally during several centuries, and that of the roots of *Asarum Canadense*, an American species, which has found medicinal application in our own country. The volatile oils of these two species having been found to differ very materially from each other, Emerson R. Miller has now subjected the volatile oil of another American species, *Asarum arifolium*, to chemical investigation, and finds this to differ in composition from the other two volatile oils mentioned. Thus Peterson (1888) found in the volatile oil of *Asarum Europæum*, besides asarone, l-pinene, methyleugenol and a green to blue oil from which, however, a single product could not be produced; while Power (1880) found in the volatile oil of the roots of *Asarum Canadense* a phenol, $C_9H_{12}O_2$, having a creosol-like odor, pinene, d-linalool, l-borneol, l-terpineol, geraniol, methyleugenol, a blue oil boiling at 26°, a lactone, $C_{14}H_{20}O_2$, palmitic acid, acetic acid and a mixture of fatty acids from $C_6H_{12}O_2$ to $C_{12}H_{24}O_2$. In 1895, Prof. L. M. Underwood called attention to the pleasant aromatic odor of the leaves of *Asarum arifolium*, reminding of sassafras oil, and this odor was subsequently found by Mr. Miller to be more pronounced in the roots of the plants, which were, therefore, selected for his investigation. Calculated for the dry material, these roots yielded from 7 to 7.5 per cent. of volatile oil by distillation with steam, which when recently prepared is a colorless liquid, gradually changing on standing to yellow and reddish-yellow. In odor, it resembles that of sassafras oil, its taste is pungent, its sp. gr. 1.0585–1.0613, and its rotatory power at 17° C. in a 1000 Mm. tube, in 3 samples, was found to be: 3°, 2° 55′ and 3° 7′. It is clearly miscible in all proportions with alcohol, ether, chloroform, benzol, methyl alcohol and amyl alcohol, but produces turbid mixtures

with carbon disulphide, acetic ether, petroleum ether and oil of turpentine. Its chemical components were found to be the following: (1) l-pinene; (2) eugenol; (3) a phenol of undetermined composition; (4) methyleugenol; (5) methylisoeugenol; (6) safrol; (7) asarone; (8) a sesquiterpene (?). Safrol is the principal component. Besides these, two other bodies are present in very small quantities, a phenol and an optically active body containing a high carbon percentage, both of which require further investigation.—Arch. d. Pharm., *240*, No. 5 (July 25, 1902), 371–385.

*Oil of Badiana—Examination of the Japanese and Chinese Products.*—E. Tardy has subjected Japanese and Chinese badiana oils to fractionation and chemical examination. With the Japanese article he failed to obtain satisfactory results; he simply obtained two groups of substances, the one between 150° and 180°, the other at temperatures between 220° and 280°. With the Chinese oil, which is very different from the Japanese oil, his results were more satisfactory. He succeeded in fractionating it into many portions (at least two dozen, coming over below 150° to that coming over at 230° to 235°. It contains pinene, phellandrene, astragol, dextrogyre terpilenol, anethol, a levogyre sesquiterpene, anisic aldehyde, anisic acetone, anisic acid, a small quantity of a crystalline body, $C_{20}H_{22}O_3$, and an equally small quantity of the ethyl ether of hydroquinone.—Chem. News, March 20, 1902; from Bull. Soc. Chim. (3), *27*, Nos. 18 and 19.

*Lemon Bay Oil—Source, Etc.*—In a paper on the preparation of concentrated oils in the West Indies, Mr. J. H. Hart points out that there is a variety of *Pimento acris* which yields a volatile oil differing materially from the ordinary bay oil used to make bay rum, in having a distinct lemon odour, and which is distinguished as lemon bay oil. Messrs. Schimmel & Co., who have examined the oil, report that it contains citral. —Pharm. Journ., May 16, 1903, 679; from West Ind. Bull., iii., *171*.

*Oil of Bergamot Leaves—Character and Uses.*—S. Gulli made some observations on the preparation, character and uses of the oil of bergamot leaves, the distillation of which is carried on to a limited extent, and takes place between February and April, when the trees are pruned. The yield also is small (100 kilos leaves give only 150 grams oil), and the total annual production does not perhaps exceed 20 to 25 kilos. The pure oil has a specific gravity of about 0.870 to 0.873°, and an optical rotation of +25° to +26°; it is soluble in an equal proportion of 90 per cent. alcohol. It contains about 32 to 34 per cent. ester, calculated as linalyl acetate, and, in addition to this, also methyl ester of anthranilic acid. The author furthermore states that the oil is rarely found in the pure state; the bergamot leaves are frequently distilled after turpentine oil has been added, and even more often leaves and young saplings of bitter orange are added into the still. It is also said that adulterations are extensively

practised with the addition of peel essences. The oil is, however, not only subject to adulteration, but is itself used as an adulterant, chiefly for mixing with oils of petitgrain and orange flowers.—Chem. and Drugg; 1902, 995.

*Oil of Birch Buds—Properties.*—According to H. Haensel the volatile oil, which is obtained from birch buds to the amount of 6.25 per cent. is fragrant, of a deep green color, has the sp. g. 0.9592 at 20° C.. and the opt. rot. + 6° 25′. The oil is not perfectly clear at 20° C.; at 17° C. it throws down a precipitate of minute crystalline spangles, at 15° C. it becomes thicker, and at – 45° C. ceases to be fluid. It is perfectly soluble in ether, amyl alcohol, chloroform, acetic ether, and absolute alcohol; imperfectly dissolved by petroleum ether, and insoluble in glacial acetic acid, carbon disulphide, and solution of caustic potash. The yield is 6.25 per cent..—Pharm. Post, *35*, 715.

*Calamintha Oil—Substitution for Oil of Sweet Marjoram.*—In a communication to Messrs. Schimmel & Co., Prof. Genoresse expresses the belief that an oil supplied to him as oil of sweet marjoram was not obtained from *Origanum marjorana* at all, but from

*Calamintha Nepeta*, a plant distributed in the Mediterranean countries, which in the south of France is wrongly designated as marjoram. Genoresse and Chablay have now communicated some further particulars concerning this oil. They find that calamintha oil contains a small quantity of l-pinene, a hitherto unknown ketone, $C_{10}H_{16}O$, to which the name calaminthone has been given, and, in the portions boiling about 225°, pulegone. Calaminthone boils under 745 Mm. pressure at 208° to 209°, and at 20° has the specific gravity 0.930. The oxime produced from it melts at 88° to 89°, and in ethereal solution combines with dry hydrochloric acid gas into an addition-product melting at 165°; the melting point of the semicarbazone lies at the same temperature. Calaminthone yields as products of reduction, menthone and menthol. With the exception of the position of the double linking, which still remains to be ascertained, the constitution of this ketone has thus been determined with a fair amount of certainty.—Schimmels' Rep., April–May, 1903, 50; from Compt. rend., *136* (1903), 387.

*Calamus Oil—Constituents.*—In continuation of previous investigations of the constituents of calamus oil, made in conjunction with Thoms, R. Beckstroem reports the results of his recent investigations. He states that the body hitherto called "calamus camphor" is neither an alcohol nor a ketone, but, in view of its constitution, can be compared to cineol, and he has named this new body

*Calameone.*—This is oxidized by potassium permanganate, at ordinary temperature, into a monobasic acid $C_{15}H_{24}O_4 + H_2O$, calameonic acid, containing one molecule water of crystallization, and melting at 153°. When

heated to its melting point, this acid becomes anhydrous, and then melts at 138°. When calameone is treated with bromine, compounds are formed which have the formulæ $C_{15}H_{21}Br$, $C_{15}H_{20}Br_2$ and $C_{15}H_{18}Br_4$. With hydrochloric acid, calameone yields a product of addition melting at 119°. As already mentioned in our last report, a hydrocarbon $C_{15}H_{22}$ is formed when calameone is heated with a 50 per cent. solution of sulphuric acid; this hydrocarbon the author has named "calamene." When treated with bromine it yields a compound $C_{15}H_{21}Br$, and upon oxidation with potassium permanganate, an acid of the melting point 196° (in addition to acetic and oxalic acids). The compound $C_{13}H_{24}O$, which was thought to represent a uniform body, has subsequently been found to be a hydrocarbon containing asarone. With regard to the aromatic body to which calamus oil owes its specific odor, Beckstroem believes that, as it also occurs on oxidation of asarone into asarylic aldehyde, it represents an intermediate product of this oxidation-process.—Schimmel & Co., Rep., Oct.–Nov., 1902, 14; from "Thesis" of Author, Berlin.

*Camphor and Camphor Oils—Production in Japan.*—In a paper on "The Manufacture of Safrol from Camphor Oils," published in the Journal of the Pharmaceutical Society of Japan (No. 242, 1902), Nakazo Sugiyama gives some interesting information on the production of camphor from camphor oils, and on their distinction according to variety or source. Distinction is made between four kinds of camphor, viz., Joko camphor, Tehuko camphor, mountain camphor, and refined camphor. Joko camphor is Tehuko camphor well dried; mountain camphor is the name given to the article which is obtained from the source of production. Refined camphor is the product manufactured in the districts of Osaka and Kobe by separation from the crude camphor oil. The camphor exported to Europe and America is chiefly mountain camphor; in addition to this, refined camphor is also exported. Camphor oil is classified as "crude oil," "white oil," and "red oil."

*Crude Camphor Oil* is made by submitting to distillation chips of camphor wood mixed with water. After removal by mechanical means, of the camphor which crystallizes out on cooling, it represents a transparent, bright yellow to brownish-yellow, liquid oil, which has a penetrating odor. The specific gravity varies according to the origin and the age of the trees. Products from the provinces Izu and Kii, and from the older trees, generally have a higher specific gravity, whilst oils from Kiyushu, Riyu-Kiu, Zuschima and Tai-Wau, or from younger trees, show a lower specific gravity. As a rule the specific gravity fluctuates between 0.95 and 0.995.

*White Camphor Oil* is obtained from the crude camphor oil by fractional distillation, after separation of the camphor; it represents a colorless-transparent, mobile essential oil, whose odor, like that of camphor, is

penetrating; sp. gr., about 0.87 to 0.91. When cooled to 20°, no separation takes place; it boils at 150° to 195°; it consists of pinene, phellandrene, cineol and dipentene—together with from 3.75 to 8 per cent. of camphor, as determined in recent experiments recorded by the author.

*Red Camphor Oil* is obtained from the crude camphor oil by means of fractional distillation, after white camphor oil and then camphor have been removed. The portions boiling higher than camphor and white oil are collected; they represent a transparent, brown to dark-brown, mobile oil, which is volatile, and has a faint, penetrating odor like camphor. Specific gravity about 1 to 1.035. It boils at 225° to 270°, and consists principally of safrol; it also contains eugenol and a very small quantity of camphor. In order to obtain

*Safrol* from this red camphor oil, it is submitted to fractional distillation, and the portions in the neighborhood of the boiling-point of safrol, which have high specific gravities, are collected. Their temperature is then considerably reduced, until rhombic, transparent crystals separate out, which in a strongly-cooled room are collected on a filter for the purpose of separating them from the mother liquor. By repeated recrystallization the author obtained about 21 per cent. of safrol having the following characters: Colorless, rhombic crystals, or a colorless, transparent liquid, specific gravity 1.107 at 15° C. Boils at 230° to 235°; when cooled to —20°, white aggregates of crystals are formed which do not yet melt at + 12°. Dissolves very readily in 2 to 5 drops alcohol, chloroform or ethyl ether. In sulphuric acid it dissolves with a violet-red, in nitric acid with a deep-red color.—Schimmel's Rep., Oct.–Nov., 1902, 16–22.

*Camphor Oils—Commercial Quality.*—Edwin Dowzard states that the commercial camphor oils of the present day are entirely different from those which were common fifteen years ago. The more complete extraction of the camphor and the removal of the safrol leaves as a by-product a light oil, consisting principally of terpenes. The following figures were obtained in the examination of five oils of different quality. Nos. 1 and 2 are typical light oils of the present day. No. 3 is a fairly good oil. No. 4 is a very good oil, and No. 5 is a first-class oil, but an oil of a quality seldom met with:

| | Sp. Gr. | Rotation (100 Mm). |
|---|---|---|
| No. 1 | 0.8895 | + 23° 38′ |
| No. 2 | 0.9124 | + 18° 0′ |
| No. 3 | 0.9260 | + 13° 0′ |
| No. 4 | 0.9817 | + 18° 52′ |
| No. 5 | 0.9980 | + 9° 10′ |

—Chem. and Drug., Sept. 20, 1902, 520.

*Camphor Oil—New Variety.*—Messrs. Schimmel & Co. call attention to a new variety of camphor oil, which is distinct from the so-called light and

heavy camphor oils, being viscid and having a beautiful blue color. It has a sp. gr. of 0.950 to 0.960 at 15° C.; b. p. 280° to 300°; optical rotation, +32° 55′, and appears to consist chiefly of a body of an alcoholic character, a fairly large saponification number being obtained after treatment of the oil with acetic acid anhydride.—Schimmel's Rep., Oct.-Nov., 1902. 15.

*Light Oil of Camphor—Use as Adulterant.*—E. J. Parry calls attention to the considerable use of the light oil of camphor as an adulterant of more valuable essential oils, in this way partly superseding the coarser adulterant, oil of turpentine. He has found the oils of peppermint and eucalyptus adulterated, and also oil of wintergreen. Light oil of camphor occurs in the market in several forms. Sometimes it is found as an oil from which only a portion of the more valuable constituents has been removed, still possessing a fair odor and considerable value for low-grade soap perfumery. Frequently, however, all the heavy constituents have been removed, and no trace of safrol can be detected in the oil, which is then found to be merely a mixture of terpenes, and of little different properties from ordinary turpentine.—Chem. & Drug., Sept. 20, 1902, 520.

*Camphidone and Camphidine—New Derivatives of Camphoric Acid.*—Two new camphoric acid derivatives, named camphidone ($C_{10}H_{15}NO$) and camphidine ($C_{10}H_{19}N$), produced from the amide of camphoric acid, $C_{10}H_{15}NO_2$, by electrolytic reduction, are the subject of a recent patent. The camphoric amide, dissolved in 65 per cent. sulphuric acid, is placed in the cathode compartment, the anode compartment being filled with dilute sulphuric acid, and an electric current is passed for three and a half hours. The major part of the sulphuric acid is then precipitated by calcium carbonate, and the camphidone produced is extracted from the filtrate by repeated shaking with chloroform. On evaporating the chloroform the camphidone is obtained as a soft crystalline mass of weak camphor-like odor. The mass melts at 220° C., sublimes at higher temperatures, and boils at 308° C. It yields a characteristic picrate. The remainder of the filtrate above mentioned is supersaturated with alkali, and the camphidine is then driven over by steam. The product is a soft crystalline body of intense camphor-like odor, which melts at 186° C., boils at 209° C., and is strongly basic.—Pharm. Journ., Oct. 18, 1902, 387.

*Oil of Cassie Flowers—Constituents.*—In a former report (April, 1901, 18) Messrs. Schimmel & Co. mentioned that they had succeeded in isolating from the oil of cassie flowers (*Acacia farnesiana*, Willd.), in addition to methyl ester of salicylic acid and a ketone of a very pleasant violet-like odor, also benzyl alcohol by means of phthalic anhydride. Recent examitions have shown that in all probability linalool and geraniol are also present. Further, they were lately able to obtain a crystalline compound by shaking with bisulphite solution a fraction of oil boiling from 95° to 105° at 11 Mm. When this compound was boiled with soda solution an alde-

hyde was soon split off, which was immediately identified by its intense characteristic odor as decylic aldehyde.—Schimmel's Rep., April–May, 1903, 17, 18.

*Oil of Cedrus Atlantica—Constituents.*—Emilier Grimal finds that the oil of *Cedrus Atlantica*, the Algerian variety of *Cedrus Libani*, contains cadinene, $C_{15}H_{24}$, and a ketone, $C_9H_{11}O$. The peculiar odor of the oil is due to the latter body. The oil also contains traces of acetone, and several sesquiterpene alcohols which have not yet been investigated.—Pharm. Journ., Nov. 15, 1902, 491; from Comptes rend., *135*, 582.

*Artificial Cinnamon Oil—Production.*—It is well known that cinnamic aldehyde is the chief constituent of cinnamon oil, other known constituents being phellandrene and eugenol; but a mixture of these three substances in their natural proportions does not yield a product having the delicate and characteristic odor of the natural oil. Messrs. Schimmel & Co. have recently patented a method for producing an oil closely resembling that of true cinnamon, which involves the use, in addition to the three substances mentioned above, of normal amyl-methyl ketone, nonylaldehyde, cuminaldehyde, caryophyllene, linalool and its butyric ether, cymol, benzaldehyde, phenyl-propyl aldehyde, furfurol, pinene and eugenol methyl ether. All these have been recognized as constituents of true cinnamon oil, and the first six are of most importance in reproducing an odor resembling that of the natural product.—Chem. Ztg., 1902, 1045.

*Oil of Cinnamon Leaves—Constituents.*—The volatile oil of cinnamon leaves has been shown to differ from that of the bark (Ceylon cinnamon) by its high content of eugenol—70 to 90 per cent.—and exceptionally low content of cinnamic aldehyde—0.1 per cent. Messrs. Schimmel & Co. now give the results of a recent examination of the oil of cinnamon leaves. This oil had the following constants: Specific gravity, 1.0479; optical rotation —0° 10′; saponification number 40.2. 10 kilos of the oil were shaken with soda liquor (about 2 per cent.) in order to remove the bulk of the eugenol. The dried oil (1.4 kilo) which now only contained a small quantity of eugenol, was next distilled in vacuo. It passed over between 34° (25 Mm. pressure) and 110° (12 Mm.). The portions boiling up to 71°, at 9 Mm. pressure, are probably chiefly terpenes and benzaldehyde. The next fractions, boiling up to 90°, were lævogyre, had a linalool-like odor, and yielded citral on oxidation with chromic acid mixture. The citral purified with the bisulphite compound distilled at 227° to 232°, and when treated with pyruvic acid and β-naphthylamine, yielded citral-β-naphthocinchoninic acid of the melting-point 198°. This proves the presence of linalool also in oil of cinnamon leaves. At a higher temperature than the fractions containing linalool, considerable quantities of safrol passed over. The oil did not appear to contain cinnamic aldehyde—or if at all, only in infinitesimal quantity.—Schimmel's Rep., Oct.–Nov., 1902, 27.

*Citronella Oil — Examination of Adulterated Samples.*—Very large quantities of citronella oil have recently appeared on the English and American markets, which do not pass Schimmel's test, as many as a hundred or more samples, representing different drums, having been submitted to Messrs. John C. Umney and E. J. Parry for examination. The following figures were obtained from eight samples of such oils by the latter and C. T. Bennett, Mr. Umney's analytical assistant:

| — | Sp. Gr. at 15° C. | Rotation in 100 Mm. | Esters as Geraniol Acetate. | Total Acetylizable Constituents as Geraniol. |
|---|---|---|---|---|
| | | | Per cent. | |
| 1 | 0.892 | —11° | 13.0 | 53.3 |
| 2 | 0.897 | —12° | 15.4 | 57.6 |
| 3 | 0.891 | —11° | 15.3 | 57.5 |
| 4 | 0.891 | —10° | 17.3 | 53.6 |
| 5 | 0.892 | —10° | 14.7 | 51.5 |
| 6 | 0.893 | —10° | 16.3 | 55.4 |
| 7 | 0.893 | —11° | 14.2 | 52.6 |
| 8 | 0.891 | —10° | 15.0 | 56.8 |

The oils formed a practically clear mixture with an equal volume of 80 per cent. alcohol, but on further addition of the alcohol oily drops separated, and from 5 to 6 per cent. of an insoluble oily liquid rose to the surface after standing for about twelve hours. An examination of the insoluble portion thus separated showed at once that it had no characters in common with kerosene, the once common adulterant of citronella oil. Further examination of this body which is given in some detail, gave evidence that leads the author to the belief that the adulterant is a fairly pure resin spirit or light resin oil, the product of destructive distillation of resin. Products of this character are met with in commerce which, at the present time, are of only about half the money value of turpentine. They found that mixtures of 15 parts of a typical sample of resin oil (sp. gr. 0.8345, opt. rot. + 3°) with 85 parts of pure citronella oil has physical characters very similar to the abnormal citronella oils examined by them.—Chem. & Drug., Jan. 17, 1903, 88–89.

*Citronella Oil—Standards for the Pure Product.*—Since making the examinations of adulterated citronella oil above mentioned, the authors have had occasion to examine nearly one hundred further samples of similar character, from which it is evident that the market is now flooded with the sophisticated product. They have therefore considered it necessary to examine a number of samples of pure oil, in order to suggest a standard which can, if necessary, be used as a guarantee of purity, in place of the hitherto useful "Schimmel's" test. As a result of these investigations, which are given in detail, the authors now suggest the following standard for pure citronella oil:

1. The oil must dissolve either clear, or at most with the slightest opalescence, in 10 volumes of 80 per cent. alcohol at 20° C.

2. The first 10 per cent. distilled under reduced pressure (20 to 40 Mm.) must have a sp. gr. not below 0.858 and a refractive index at 20° not below 1.4570.

The authors think it may be regarded as certain that no adulterated sample will pass these tests, although the limit for refractive index has been placed lower than the figures found for normal Ceylon oils, in order to meet the requirements for other oils, such as Java, &c.—Chem. & Drug., Mar. 7, 1903, 409.

*Lemon-Grass Oil—Adulteration with Acetone.*—Referring to the recent observation of Bennett that "acetin" has been found as an adulterant of peppermint oil (which see), Ernest J. Parry calls attention to an adulteration of lemon-grass oil by "acetone." The adulterated sample yielded the following figures on analysis:

| | |
|---|---|
| Specific gravity | 0.893 |
| Optical rotation | —1° 50′ |
| Solubility in 3 vols. 70 per cent. alcohol | Complete. |
| Citral (apparent) | 76 per cent. |

Except for low specific gravity there was nothing in these figures to excite suspicion; the high aldehyde-content and easy solubility were against the idea of adulteration with the decitralized residues of lemon-grass oil. The odor of the oil was, perhaps, a trifle abnormal, but no definite suggestion could be gathered from this. On fractionating the oil, he eventually obtained a small fraction which came over between 55° and 60° C., was soluble in water, and gave a marked reaction with fuchsine and sulphurous acid—these proving it clearly to be acetone. The author concludes that so long as a lemon-grass oil is pure, the oil should be valued and sold on its citral-content, in the same way as cassia oil, but it is necessary to determine the purity of the oil before determining this figure. The odor of acetone would be a bar to its extensive use for adulterating oils, but acetone and acetin are undoubtedly a dangerous combination in the hands of a really skilled adulterator.—Chem. and Drug., May 9, 1903, 768.

*"Java Lemon Olei"—A New Kind of Citronella Oil.*—Under the designation, "Java Lemon Olei," Messrs. Schimmel & Co. have recently received several samples of oils which can neither pass for lemongrass nor for palmarosa oil, and which should rather be considered as a kind of citronella oil, although they slightly differ from the latter in the odor. The mother-plant from which the oil is obtained is presumably a species of *Andropogon:* we know nothing definite about this, but will endeavor to ascertain further details of the origin of this oil. The samples obtained from different sources show a fair amount of similarity in their constants, as will be seen from the following short table:

| $d_{15°}$. | $a_D$ (in 100 Mm. tube). | $n_{D20°}$. | Total content of $C_{10}H_{18}O$. |
|---|---|---|---|
| 0.8889 | +13° 26′ | 1.46466 | 48.09 per cent. |
| 0.8914 | +10° 6′ | 1.46684 | 50.9 per cent. |
| 0.8808 | +14° 52′ | 1.46496 | 49.18 per cent. |

The oils dissolve readily in 80 per cent. alcohol, but when the concentrated solution is diluted, turbidity occurs uniformly. To all appearances they do not contain geraniol, but this statement is subject to further verification, as in every case we have only had small samples at our disposal, and therefore were unable to make a thorough examination. From the samples mentioned last the aldehyde content was isolated by shaking with bisulphite solution. In the odor it completely resembled citronellal, whose physical constants it also possesses: boiling-point 205° to 208°, $d_{15°}$ 0.8567, $n_{D20°}$=1.44791; but it was found to be lævogyrate, as we observed $a_D = -3°$. This is consequently the first time that *l*-citronellal has been detected as a constituent of an essential oil. The melting point of the semicarbazone which was produced for the further identification, and was prepared according to Tiemann's directions, and was found at 74°. In the portions of the oil which did not react with bisulphite solution, cineol could be detected with certainty; they probably also contain limonene, or a mixture of limonene and dipentene.—Schimmel's Rep., April May, 1903, 22, 23.

*Oil of Cloves—Presence of Benzoic Acid and Methyl-Heptyl Ketone.*—In their Report, in April, 1902, Messrs. Schimmel & Co. had announced the detection of benzoic acid, although in small quantity, and probably in the form of methyl ester, in oil of cloves (see Proceedings 1902, 972), the acid being contained in the first runnings of the distillation. They now confirm the presence of the benzoic acid as methyl ester, and that in the final fraction obtained under conditions described by them it is associated with a body which they recognize as being

*Methyl-Heptyl Ketone.*—This was obtained in a practically pure condition and the semicarbazone prepared from it, which proved to be identical in melting point and its general characters with the semicarbazone prepared from methyl-heptyl ketone of undoubted identity. The presence of this ketone in clove oil is interesting because hitherto it has only been found in oil of rue.—Schimmels' Rep., April–May, 1903, 25–27.

*Eugenol—Determination in Oil of Cloves.*—Messrs. Schimmel & Co. have made some practical experiments in order to test the availability of the method proposed by Verley and Bölsing for the quantitative estimation of alcohols and phenols in volatile oils (see Proceedings, 1902, 962), selecting the determination of eugenol in oil of cloves for this purpose. The proposed method is based on the esterification of the alcohols (or phenols) in the presence of pyridine by means of a known quantity of acetic anhydride, and the titration of the uncombined acetic acid after the

esterification is completed. The published results of the present experiments seem to justify an unfavorable opinion by the Messrs. Schimmel & Co. on the proposed method. They, on the other hand, favor the method proposed by Umney, modified by reducing the strength of the potash liquor used for extracting the clove oil from 10 per cent. to 5 per cent., as suggested by them last year (see Proceedings, 1902, 972). The results by the modified method of Umney are perfectly satisfactory; but in order to avoid all misunderstanding, it is pointed out that they can only guarantee the eugenol content of oil of cloves on the basis of the modified Umney method.—Schimmel's Report, April–May, 1903, 27–28.

*Eugenol—Determination in Oil of Cloves.*—In view of the large demand for eugenol, and the consequent importance of a practical method for its determination in oil of cloves, E. C. Spurge has undertaken a series of experiments with the object of testing the reliability of the method of Thoms, as given by him originally and reproduced in the works of Gildermeister and Hoffmann, and Parry, and to compare it with the results obtained by the methods of Umney and of Verley and Bölsing. From the results of these experiments, which are given in detail, the author draws the following conclusions:

(1) None of the methods gives strictly accurate results.

(2) Clove oil contains considerable quantities of eugenol as ester—from 7 to 17 per cent. calculated as eugenol acetate.

(3) The eugenol as ester ought to be taken into account in determining the percentage of eugenol.

(4) The method of Thoms, as given by him and in the standard books, only partially determines the eugenol as ester. The correction, moreover, is far from accurate. The method is capable of improvement, but, on account of its tediousness, it is better to employ other methods.

(5) Umney's method determines the free and combined eugenol. The high results obtained by the method are chiefly due to the presence of esters. It is quick and convenient, and the results, even when uncorrected, are more accurate than those obtained by Thoms' method. By saponifying the oil and correcting results within 2 per cent. can be obtained.

(6) The free eugenol can be determined within 1 per cent. by Verley and Bölsing's method, which is both quick and simple.

(7) To evaluate a clove oil either Verley and Bölsing's process plus the eugenol by saponification, or Umney's modified method minus the correction obtained from saponification figures, should be used, together with a determination of the specific gravity. Verley and Bölsing's method plus the eugenol by saponification is doubtless the more accurate, but for a pharmacopœial test Umney's method, uncorrected, together with the specific gravity, would perhaps be accurate enough, whilst it is certainly the simplest.—Pharm. Journ., May 23 and 30, 1903, 701, 702 and 757, 758.

*Oil of Dill—Variation of Constituents According to Source.*—Schimmel

& Co. describe a sample of dill oil, received from Spain, which had been distilled exclusively from the dill plant, and which differed in its properties in a marked degree from normal dill oil. Its physical constants were as follows: $d_{15°}$ 0.9282, $a_D$ + 45° 47′, $n_{D20°}$ 1.49638; it was insoluble in 80 per cent. alcohol, but formed a clear solution with about 5 volumes of 90 per cent. alcohol. Judged by the odor, the oil appeared to have a large phellandrene-content; this supposition was soon confirmed, for when the oil was tested for phellandrene in the usual manner, it gave an exceptionally strong reaction. A trial to determine the carvone-content by titration with hydroxylamine hydrochloride, showed that it amounted only to about 10 per cent. As dill oil is met with both free from phellandrene and also containing phellandrene, the presence of this hydrocarbon must perhaps be attributed to the fact that the oil has been distilled not exclusively from the fruit, but from both the fruit and the herb, and the phellandrene-content will vary according to the quantity of the latter.—Schimmel's Rep., April–May, 1903, 30.

*Oil of Erigeron—Commercial Variability.*—In connection with their observations on oil of fireweed (which see), Lyman F. Kebler and Dr. George R. Pancoast note that either the commercial erigeron oils are themselves adulterated, or they vary materially in properties. They, however, incline to the latter view, as the oil readily resinifies. In six samples, the specific gravity varied from 0.8549 to 0.8963, the optical rotation from + 28° 48′ to + 84° 28′, and the boiling-point from 172° to 178° C., with a slight residue.—Amer. Journ. Pharm., May, 1903, 217.

*Eucalyptus Oil—Deficiency of Eucalyptol in Commercial Samples.*—Robert C. Pursel and Willard Graham have recently had their attention called to several samples of eucalyptus oil which contained very little eucalyptol. The odor appeared to be abnormal, and upon being assayed all samples were found to contain less than 25 per cent. of eucalyptol. A fair oil of eucalyptus should contain 40 to 50 per cent., and samples have been met with that contained as much as 75 per cent. eucalyptol, the latter, however, are not usually sold for the commercial oil.—Proc. Pa. Pharm. Assoc., 1902, 147.

*Eucalyptus Oils—High Cineol-Content.*—Edwin Dowzard observes that the most remarkable fact concerning the eucalyptus oils of the present day is the high cineol-content of a large number of commercial samples. The following table illustrates this:

| | Cineol per cent. | Sp. Gr. | Rotation (100 Mm.). |
|---|---|---|---|
| No. 1 | 80 | 0.9260 | + 0° 10′ |
| No. 2 | 80 | 0.9250 | + 0° 20′ |
| No. 3 | 74 | 0.9231 | + 1° 8′ |
| No. 4 | 73 | 0.9236 | + 1° 50′ |
| No. 5 | 73 | 0.9213 | — 0° 54′ |
| No. 6 | 71 | 0.9210 | — 3° 0′ |
| No. 7 | 69 | 0.9205 | + 3° 30′ |
| No. 8 | 68 | 0.9212 | + 2° 38′ |

57 —Chem. and Drug., Sept. 20, 1902, 520.

*Oil of Eucalyptus Macarthuri—Constituents according to Season.*—H. G. Smith records the results of continued investigations on the ester (geranyl acetate) contained in the oil of *Eucalyptus Macarthuri*, and also on the oil itself. These data show that the ester does not fall at any time of the year below 60 per cent. and that the amount of free alcohol, considered as geraniol, diminishes in amount as the ester increases. The greatest amount of naturally formed ester occurring at any time of the year was 74.9 per cent. in September, but the free alcohol was only 6 per cent. at that time. It has been found from numerous determinations that when the oil is acetylized the ester content will be but little removed from 80 per cent. The oil does not contain phellandrene at any time of the year, and eucalyptol appears to be always absent. Eudesmol is always present, but as it varies in amount the specific gravity of the oil varies also. The crude oil appears to be always slightly dextrorotatory. From the results of investigation of the oil obtained from more than one hundred distinct species of eucalyptus, this is the only one found to contain this valuable oil.—Pharm Journ., Sept. 20, 1902, 295; from Nature, *66*, 456.

*Oil of Bitter Fennel—Examinations of the Algerian and Galician Product.*—E. Tardy has examined specimens of Algerian and Galician oil of bitter fennel in order to compare them with the French product. He finds that the Galician oil contains fenchone (fenone) in larger amount than either the French or Algerian samples. The proportion of methyl chavicol (astragol) is greatest in the Algerian, and smallest in the Galician. The hydrocarbons are present in about the same ratio as astragol. This result the author considers to be due to the influence of climate.—Pharm. Journ., Nov. 15, 1902, 491; from Bull. Soc. Chim. de Paris, *27*, 994.

*Oil of Fireweed—Sophistication by Oil of Erigeron.*—Lyman F. Kebler and Dr. George R. Pancoast state that genuine oil of fireweed, *Erechthitis hieracifolia*, is comparatively a commercial variety. This is probably primarily due to the ignorance of the small distillers—farmers, etc.—who fail to make a distinction between the "weeds" commonly known by the name of "fireweed," a term applied to no less than six different wild plants; but dealers also must be held responsible, since some of them do not hesitate to fill an order for fire-weed oil with erigeron oil and label it fireweed oil. In the course of an experience of many years they have met only with two consignments that complied approximately with the recognized normal constants of fire-weed oil. These constants are based on the studies of pure oils by A. M. Todd (1887), and by F. B. Power a few years later, and may be referred to in the present paper, together with the typical constants of the products frequently supplied in oil of fireweed.—Amer. Journ. Pharm., May, 1903, 216–217.

*Gardenia Oil—Characters and Constituents.*—E. Parone communicates the results of an investigation of the properties and chemical composition

of the essential oil of gardenia. The gardenia oil obtained by maceration from the fresh gardenias gathered during the flowering season, has a yellowish color, and possesses at 20.5° the specific gravity 1.009. The specific rotation is $[a]_D = +1.47°$, at 20°, in a 50 Mm. tube. At ordinary pressure the oil commenced to boil at 204° with partial decomposition; at a pressure of from 12 to 15 Mm. the bulk passed over between 84° and 150°. Parone has detected the following bodies as constituents of gardenia oil: benzyl acetate, styrolyl acetate [acetate of the methyl phenyl carbinol $C_6H_5.CH.(OCOCH_3)CH_3$], linalool, linalyl acetate, terpineol and methyl ester of anthranilic acid. While benzyl acetate represents the principal constituent of gardenia oil, the aroma peculiar to the oil is chiefly due to the styrolyl acetate.—Schimmel's Rep., April–May, 1903, 41; from Bull. Chim. Farm, *41*, 489, through Chem. Centralbl., 1902, II, 703.

*Oil of Genista Tinctoria.—Yield and Properties.*—According to H. Haensel the oil of *Genista tinctoria* yields 0.023 per cent. of a concrete volatile oil, melting at 36° C., and congealing at 31° C. The fluid oil is dark brown, with an aromatic, pleasant odor; sp. gr. 0.89; it reddens blue litmus paper. The oil commences to distil at 80° C. At 100° C. about 5 per cent. of a light yellow oil is obtained. A further 10 per cent. distils between 100 and 210° C., which is dark brown. The major fraction distils at about 280° C.—Pharm. Post, *35*, 715.

*Oil of Hops—Specific Gravity.*—A. C. Chapman has ascertained the following specific gravities of oil of hops:

| | Specific Gravity. | |
|---|---|---|
| | 15 / 15° | 20 / 20° |
| No. 1 | 0.8802 | 0.8776 |
| No. 2 | 0.8662 | 0.8636 |
| No. 3 | 0.8771 | 0.8739 |
| No. 4 | 0.8743 | 0.8716 |
| No. 5 | 0.8676 | 0.8645 |
| No. 6 | 0.8639 | 0.8610 |
| No. 7 | 0.8403 | 0.8357 |

The mean difference for 1° based on the above 7 sets of determinations made with 7 different samples of oil is 0.00062, which is almost identical with the average number 0.00064 for all the essential oils examined.—Pharm. Rev., April, 1903, 155.

*Kaempferia Oil—Constituents.*—Some time ago (1900) P. van Romburgh determined in the essential oil of *Kaempferia Galanga* L., ethyl p-methoxy cinnamate as principal constituent. When recently examining the liquid portions of the oil, the author obtained a fraction boiling between 155° and 165° (30 Mm.), which could be split up by saponification into cinnamic acid and ethyl alcohol, and which, therefore, consisted of ethyl cinnamate. This body, which represents almost one-fourth part of the oil, could only be separated with difficulty from a substance of nearly the same

boiling-point. The separation could finally be accomplished by treating the mixture with 80 per cent. alcohol, in which the bulk of the ester dissolved. The remaining portion was purified by boiling with potash, treatment with a solution of bromine in chloroform, and shaking with concentrated sulphuric acid. In this manner van Romburgh obtained an inactive color- and odorless liquid of the boiling point 267.5° (738 Mm.) and the specific gravity 0.766 at 26°, which on cooling solidified completely. By analysis and determination of molecular weight, the formula $C_{15}H_{32}$ was obtained. The only hydrocarbon of this composition known up to the present is pentadecane, described by Krafft, whose properties so closely agree with those of the body found, that the identity of the two cannot be doubted. More than half the liquid portion of kaempferia oil consists of paraffin.—Schimmel's Rep., April–May, 1903, 44; from Kon. Akad. van Wetensschappen, Amsterdam, 1902, 618.

*Lavender Oils—Ester Content not a Criterion of Values*—Ernest L. Parry, in view of the frequent controversy and the existing differences of opinions concerning the valuation of lavender oil on the basis of their ester content, has subjected thirty-six samples of lavender oil, all of them pure, to examination, determining specific gravites, optical rotation and ester content. Of these he picked out twelve oils of really fine aroma, the remaining twenty-four being all of fair odor but diffcult to separate, except in groups of different grades, according to their absolute perfume value. In the first twelve samples—these having the finest aroma, the specific gravities range from 0.881 to 0.794, the average being *0.884*; the optical rotation, from + 5°10′ to 7°52′ the average being 6°*44′*; the ester content, from 24.5 to 40.3 per cent. the average being *31.7 per cent.* In the twenty-four samples of "pure lavender oils" the averages were as follows: specific gravity, *0.888;* optical rotation, *6°44′;* ester content, *32.4 per cent.* These results show conclusively that no relation exists between the ester value of lavender oils and their perfume value. The ester value may only serve for the detection of adulterant, such as oil of spike-lavender or oil of turpentine; and after it has been determined that the oil under examination is pure lavender oil, a practical test would be for example, the comparison of lavender water made from it. It should be remembered also that English oil of lavender contains but 7 or 8 per cent, of ester.—Chem. & Drug., July 26, 1902, 168–169.

*French Lavender Oil—Original Constants and Constituents.*—Messrs. Schimmel & Co. have again subjected French lavender oil to chemical examination. The bodies heretofore detected in the oils are: linalool, linalyl acetate, butyrate and valerianate (?), geraniol, pinene, cineol and coumarin. They have reinvestigated some of these bodies and established their identity, working with a genuine oil from the south of France, which had the following physical constants: Specific gravity 0.8902; optical rotation $a_D$ — 7° 6′; saponification number 110.5, corresponding to an ester-

content of 40.7 per cent. linalyl acetate. In order to prevent decomposition as far as possible, the oil was distilled *in vacuo* right from the beginning. Between 30° (40 Mm.) and 125° (5 Mm.) the whole quantity of oil passed over, apart from about 350 grammes of a resinous residue. With fuchsin and sulphurous acid, the first portions, boiling between 95° and 125°, showed a strong aldehyde-reaction. From this, and also from the fact that a crystalline compound was thereby obtained in minute quantity, from which sodium carbonate liberated a substance with strongly excited coughing, it may be assumed that valeric aldehyde was present in the first runnings. Traces of amyl alcohol also appear to be present in lavender oil. The *ketone*, $C_8H_{16}O$, to which in part lavender oil owes its refreshing odor, has also been the subject for further investigation. It is found to be present to the amount of 0.2 per cent. only, and appears to be either the methyl-hexyl, or ethyl-amyl ketone, presumably the latter—this presumption being supported by its boiling-point as well as the fact that the melting-point of the ethyl-amyl ketone—semi-carbozone is higher than that of the ethyl-amyl ketone. The presence of *d-borneol* was also determined beyond a doubt. Furthermore, it is found that in addition to free *geraniol* lavender oil contains also the *acetic* and *caproic esters* of that body.—Schimmel & Co.'s Rep., April–May, 1903, 44–49.

*Oil of Lemon—Two new Constituents.*—Schimmel & Co. observe that, although a whole series of bodies has been detected in oil of lemon, viz., d-limonene, cymene (?), phellandrene, citral, citronellal, geranyl acetate, a sesquiterpene, octyl and nonyl aldehydes, and also pinene, it has not been possible to obtain a serviceable artificial product by mixing these various substances. This is due to the fact that still further bodies, which have an important bearing on the odor, have up to now been overlooked in the examinations of lemon oil. They have recently succeeded in detecting *methyl heptenone* in the first runnings, which they identified by preparing the semi-carbazone of that body, and

*Terpineol*, having the melting-point 35°, in the last fractions of the lemon oil examined by them, which they identified by obtaining in the experiments described a very small quantity of a phenyl urethane, melting after recrystallization at 110°. A mixture of the urethane of lemon oil terpinol with the terpineol of the melting-point 35°, produced for purposes of comparison, melted at 110°. This proves the presence of this terpineol in oil of lemon.—Schimmel's Rep., Oct-Nov. 1902, 39.

*Artificial Lemon Oil—Production.*—Heine & Co. have patented a process in Germany for preparing artificial lemon oil by mixing together limonene, phellandrene, citral, citronellal, geranyl acetate, linalool, and linalyl acetate—these substances having been shown to be constituents of the natural oil. An addition of octylaldehyde or nonylaldehyde may be made in various proportions according to the variety and strength of lemon odor required.—Chem. Ztg., 1902, 1045.

*Citron Oil—Constants of a Pure Product.*—Having previously described a sample of citron oil, whose characters did not agree with those quoted by H. E. Burgess, because the two oils were pressed from a different variety of citron, Dr. Salvadore Gulli, of Reggio Calabria, obtained the fruit at the time of the harvest (the second half of November) to make the oil in his own laboratory. The method of extraction was what is called hand-pressure with a thin sponge. A thousand citrons have thus given 450 Gm. of oil of a yellow color and exceedingly fine odor and flavor. What is chiefly to be observed is that this oil, when first made, contains a large amount of minute, white crystals, and curdles into a crystalline mass, which makes the oil look as if turbid and silky. The oil examined by the author gave the following constants:

| | |
|---|---|
| Specific gravity at 15° C. | 0.851 |
| Optical rotation at 15° C. | + 80° 50′ |

A sample of citron oil pressed this year by Mr. Stavenhagen from "cedrini," has given the following constants:

| | |
|---|---|
| Specific gravity | 0.850 |
| Optical rotation | + 79° |

These values agree fairly well with those obtained by Mr. Burgess, so that they can be accepted as right for pure citron oil. The production of citron oil is very limited in the district of Reggio Calabria, its yield being about 70 to 80 pounds yearly. Owing to its high price, citron oil is subject to many adulterations. In fact, the most part of the so-called citron oil, which goes into trade at a low price, is composed of a mixture of hand-pressed oils of lemon and sweet orange in such a portion as not to visibly differ from the specific gravity and the optical rotation of the pure oil.—Chem. and Drug., Jan. 3, 1903, 22.

Referring to Dr. Gulli's paper, and particularly to his remarks concerning the admixtures of citron oil with the oils of lemon and orange, the chemists of the London Essence Company point out that any such adulterations are easily detected by distilling *in vacuo* 100 Cc. of the oil, separating with two fractions of 10 Cc. and 80 Cc. each, and steam-distilling the original oil, which should be carefully measured. In this way an adulterant of the kind described by Dr. Gulli would show for the first fraction a rotation considerably lower than the original oil, whereas it should be 6° or 7° higher for citron oil. Again, the aldehyde content would be about 25 per cent., instead of 50.53 per cent. for a genuine oil. An examination of this season's pure oil confirms the physical constants previously published, these being: Sp. gr., 0.852; rotation, + 80° 5′; ref. index, 1.4749. The distillation figures are given by the London Essence Company, as follows:

DISTILLATION.

| Quantities in Cc. | Rotations. | Zeiss Readings. | Refractive Indices. | Aldehyde Content of 3d Fraction. |
|---|---|---|---|---|
| 10 ..... | + 85° 55′ | 71.0 | 1.4730 | 53 p. c. |
| 80 ..... ..... | + 86° 5′ | 71.9 | 1.4735 | |
| 7 ..... | + 16° 30′ | 84.3 | 1.4806 | |

It would now seem to be definitely proved that the figures given above are correct, and that those workers who have published constants materially differing from those given must have worked with oils of inferior quality.—Chem. and Drugg., March 14, 1903, 393.

*Oil of Leptospermum Scoparium—Characters and Constants.*—While living in New Zealand, C. A. Atkinson obtained from the leaves of *Leptospermum Scoparium*, known under the native name "Manuka," a small quantity of volatile oil, which he describes as follows: It is of a brown color, has an aromatic odor, and a harsh, astringent taste, suggesting eucalyptus. Its sp. gr. at 12° C. is 0.916, boiling-point about 260° C., freezing point below −17° C. The color reactions, after stirring with the reagent, were as follows: $H_2SO_4$ (oil in $CS_2$), purple; HCl, pink; $HNO_3$, purple; NaOH, no action. On fractional distillation four fractions were obtained, boiling respectively at 223° C., 244° C., 265° C., and 280° C., the specific gravities of which, in the same order were—0.9105, 0.924, 0.941 and 0.976. The bromine absorption of the second fraction was 142.15 per cent., of the third 153.7 per cent., and of the fourth 92.05 per cent. Saponification of the second fraction gave a saponification equivalent of 760, Kœttsdorfer's number being 131.5.—Pharm. Journ., Oct. 11, 1902, 369.

*Oil of Sweet Marjoram—Constituents.*—According to Genoresse and Chablay oil of marjoram contains besides pulegone a new ketone and lævopinene. This ketone has a mint odor, and boils at 208° to 209° C. under 740 Mm. pressure.

*Thymol—Large Content in Algerian Origanum Oil.*—According to Battandier, Algerian origanum oil, obtained from several species of *Origanum* (*O. floribundum*, Munby, and *O. cinereum*, Noé), contains a large percentage of thymol. When shaken with alkalies, this oil loses one-fourth its bulk, and if a crystal of thymol is added to the oil, a compact mass separates out, leaving but a small quantity of mother liquor, consisting largely of carvacrol.—Apoth. Ztg., 1903, 90.

*Thymol—Solubility.*—Speaking of the uses of thymol for the preparation of different antiseptic solutions, Geo. Roe calls attention to the practical

solubilities of this body, which he finds to be as follows: 1 grain of thymol dissolves in 3 ozs. of water, in 3 drachms of glycerin or in 2 minims of olive oil; 8 grains of thymol dissolve in 3 minims of alcohol. The author gives formulas for solutions for inhalations, for spraying and a mouth-wash, which will be found under "Pharmacy."—Chem. and Drugg., May 23, 1903, 812.

*Rare Monarda Oils—Description.*—Professor Edward Kremers reports the results of some recent researches on certain monarda oils which, it appears, have not hitherto been described. The first of these is the

*Oil of Monarda Didyma*, though possibly isolated as early as 1796, has only been referred to in the literature as depositing a stearoptene identified with thymol. In fact, I. W. Brandel, who has now obtained and describes this oil, has already in a previous paper (1895), expressed the opinion that the oil from *Monarda punctata* is the only oil that had thus far been examined. *Monarda didyma* L., Oswego tea, or American bee balm—also called fragrant balm, mountain mint, and Indian plume—grows in moist soil, especially along streams, from New Brunswick to Ontario and Michigan, south to Georgia, and ascends to 5200 ft. in North Carolina. Being an article of commerce, the author subjected 100 lbs. of the herb, very dry and in good condition, to steam distillation, but obtained only 14 Cc. of oil (=0.03 p. c.), having the following preperties: Color, light reddish-brown; odor, rather sweetish, balm-like, and free from the smoky odor characteristic of phenols; sp. gr. 0.902; optical rotation, 10° to the left. Flückiger's test for thymol or carvacrol was in the negative. The sp. gr. of the oil from *Monarda punctata*, distilled by Schumann, was 0.9307; that distilled in the author's laboratory, 0.941—both at 20° per cent. The

*Oil from the Corolla of Monarda Fistulosa* was obtained and is described by J. J. Beck, who devotes a large part of his paper to the consideration of the plant pigments that impart the brilliant hue to the flowers—the discovery of thymoquinone and hydrothymoquinone in this oil having added two new substances to a rapidly increasing list of chemical substances found in volatile oils. The union of these two compounds to thymoquinhydrone, so readily effected, has given a satisfactory explanation to the color of this oil. During the summer of 1901, a large number of flowers were collected while in full bloom and the corollas carefully separated from the other organs. From 340 Gm. of these dried corollas, 9.24 Gm. (=2.71 p. c.) a dark reddish-brown oil was obtained by steam distillation. The sp. gr. was 0.9586, this high figure indicating a high percentage of carvacrol and its oxidation products, the presence of which was confirmed by Flückiger's test. The

*Oil from the Leaves of Monarda Fistulosa* was obtained by I. W. Brandel in 1901—a year before the distillation of the oil from the corollas—with the object of demonstrating that it was the quinhydrone deposited

in the outer portion of the stem that was responsible for the brown color of the oil distilled from the entire herb. That the leaves do not supply any of the pigments was certainly true of this one experiment. The oil obtained by steam distillation from the leaves carefully stripped from the dried plants was almost colorless, possessing in some degree the yellow color of carvacrol. Its sp. gr. was 0.9241 at, 20° the angle of rotation 0° 9′.—Pharm. Rev., March, 1903, 109–114.

*Oil of Milfoil—Characters and Constants.*—In a preliminary paper, A. B. Aubert gives some details on milfoil oil. Specific gravity 0.9217 (at 22°); $n_{D20°}$ 1.506; 86 parts by volume of the oil passed over at 170 to 235°, at reduced pressure; the distillate showed, according to the fractions, a more or less deep blue color. The first portions of the oil, boiling up to 190°, may possibly contain chiefly cineol, and further some small quantity of an aldehyde. Compounds of sulphur were not detected. The principal fraction of the boiling-point 210 to 220°, representing 50 parts by volume, when freshly distilled, had a blue color, which changed into yellowish-green after 1½ years' standing in the dark. Analysis and determination of molecular weight led to the formula $C_{10}H_{20}$. This fraction had the following constants: Rotatory power (in a 100 Mm. tube) 14.2°; index of refraction, 1.492; boiling-point, 254° at 754.8 Mm. The action of bromine and of hydrochloric acid yielded no characteristic products. On the other hand, the oil gave most of the reactions with terpenes. The blue distillate of milfoil oil differs, in the opinion of the author, from that of oil of chamomile.—Schimmel's Rep., Oct.–Nov., 1902, 51; from Journ. Amer. Chem. Soc., *24*, 778.

*Mustard Oil—Determination of Sulphur Content.*—T. Roeser proposes the modification of the method of Gadamer for the determination of the sulphur-content of oil of mustard in so far as to determine the excess of silver nitrate in an ammoniacal solution, instead of an acid solution according to Volhard's method, as is usually done. According to this, the process should, therefore, be as follows: When the conversion of the thiosinamine with silver nitrate, after twenty-four hours' standing, has taken place, an excess of $\frac{N}{10}$ solution of potassium cyanide is added to 50 Cc. of the clear filtrate, and the excess of potassium cyanide titrated back with $\frac{N}{10}$ solution of silver nitrate, in the presence of a few drops of a weak ammoniacal solution (5 per cent.) of potassium iodide. Comparative determinations according to this method, and after Gadamer's and Dieterich's methods, have, according to Roeser, shown no differences that were at all considerable.—Schimmel's Rep., Oct.–Nov., 1902, 52.

*Oil of Sweet Orange Flowers (Portugal)—Characters and Constants.*—According to E. Theulier, the oil from the flowers of the sweet orange, obtained by simple distillation, without cohobation, has a dark yellow color and an odor not reminding of that of ordinary neroli oil. The specific

gravity at 23° was 0.860, the optical rotation + 29° 30′, the ester-content 6.35 per cent. With 90 per cent. alcohol, the oil showed a silky cloudiness; in the cold, a paraffin of the melting-point 55° separated out. The oil distilled between 160° and 233°, and appeared to contain a considerable quantity of higher-boiling terpenes. The author succeeded in demonstrating the presence of d-camphene by means of the isoborneol melting at 212°, produced from it; of d-limonene, by the limonene tetrabromide melting at 105°, and of d-linalool by Döbner's citral-compound melting at 198.5°, which was obtained by oxidation of the fraction coming under consideration for linalool.—Schimmel's Rep., 1902, 58; from Bull. Soc. Chim., iii, *27*, 278.

*Nerol—Isolation from Petitgrain Oil.*—Soden and Zeitschel have produced from saponified petitgrain oil by treatment with phthalic anhydride and calcium chloride, a fraction which had the properties mentioned by Hesse and Zeitschel for a similar fraction obtained from neroli oil and called by them "nerol." They state that petitgrain oil contains 2 per cent. of this body. The boiling-point of the preparation, which in the opinion of the authors is now only contaminated with about 10 to 15 per cent. of geraniol, is given by them as 225° to 227°, at atmospheric pressure; $a_D$=0°, d=0.880. The odor is said to be decidedly fresher than that of geraniol. The compound absorbs 4 atoms of bromine. Boiled with acetic anhydride, it yields quantitatively an ester having an odor resembling that of geranyl acetate. The boiling-point of the ester at 25 Mm. is 134°; d=0.917. The formate is formed in the cold when a mixture is made with concentrated formic acid; it has an odor like geranyl formate. Boiling point, 119° to 121°, at 25 Mm.; d=0.928. These compounds are naturally uniform bodies, but are contaminated with the corresponding esters of geraniol; though it may be confidently expected that the authors will soon succeed in producing nerol quite free from geraniol.—Schimmel's Rep., April–May, 1903, 63–64; from Berichte, *36* (1903), 265.

*Chinese Oil of Neroli—Characters and Comparison With French Neroli and Petitgrain Oil.*—A recent consignment of Chinese neroli oil has enabled John C. Umney and C. T. Bennett to determine its physical constants and chemical constituents, and to compare the same with those of French oil of neroli and petitgrain. The oil is stated to be derived from *Citrus triptera* (Trifoliata), a species of citrus which grows luxuriantly in Southern Europe, its fruit as met with in Italy resembling the mandarin orange, although not equally edible. In England also the plant will grow out of doors, but does not produce flowers. A peculiarity of this species of citrus plant is that it possesses a very considerable number of spines, and is on that account used to form a defensive hedge. No exact information concerning the district of cultivation and distillation in China was obtainable, but the shipment appears to have been made from Foochow, near Canton. The oil is of a yellowish-brown color, becoming

paler on exposure to light and having a very slight and almost imperceptible blue fluorescence, which is very marked when largely diluted with alcohol. It has a peculiar sweet odor, a little difficult to describe, but recalling a mixture of the oils of neroli, lavender, and tarragon. It had the following physical characters: Specific gravity at 15° C., 0.850; optical rotation in a tube of 100 Mm. +35°. It will be observed in the following table that this Chinese neroli oil is most clearly allied to the so-called Portugal oil distilled from the flowers of the sweet orange. The latter, however, contains no methyl anthranilate:

| | Neroli. | | | Petitgrain. |
|---|---|---|---|---|
| | Chinese. | French (Bigarade). | French (Portugal). | |
| Specific gravity | 0.860 | 0.870 to 0.880 | 0.850 | 0.885 to 0.900 |
| Optical rotation | +35° | +1° to +5° | About +30° | −2° to +4° |
| Esters as linalyl acetate | 4.79 | 10 to 20 per cent. | About 6.5 per cent. | 50 to 75 per cent. |
| Free alcohols as linalool | 21.41 per cent. | 20 to 25 per cent. | — | 25 to 35 per cent. |
| Appearance | Fluorescent. | Fluorescent. | Not fluorescent. | Not fluorescent. |
| Known constituents | Methyl anthranilate. Linalool. Linalyl acetate. Limonene. Camphene (?). | Methyl anthranilate. Linalool. Linalyl acetate. Limonene. | *No* methyl anthranilate. Solid hydrocarb. Linalool. Dextro limonene. Dextro camphene. | *No* methyl anthranilate. Linalool. Linalyl acetate. Limonene. |

The authors express the opinion that this Chinese neroli oil cannot replace French oil of neroli, or any of the different varieties of oil of petitgrain as imported into England; nevertheless, the oil has an extremely pleasant and characteristic odor, which certainly could be taken advantage of, both unmixed or blended, for toilet perfumery, or for perfuming soap. —Trans. Brit. Pharm. Conf., 1902, 390-393.

*Oil of Mandarin-Orange Leaves — High Methyl-Methylanthranilate Content.*—Eugene Charabot finds that the volatile oil of the leaves of the mandarin orange is exceptionally rich in methyl-methylanthranilate. The oil obtained by steam distillation from the leaves is markedly fluorescent and has the rotation + 6° 40′; its saponification number is 160. This is found to be lower after acetylization. On treating the oil with dilute sulphuric acid, a mass of crystals is rapidly formed, from which, when collected, drained and treated with alkali, methyl-methylanthranilate was liberated in the form of a crystalline mass, melting at + 19° C., and giving solutions with a fine violet fluorescence. No less than 50 per cent. of this body was found to be present in the oil.—Pharm. Journ., Nov. 22, 1902, 533; from Comptes rend., *135*, 580.

*Oil of Mandarin Leaves—Characters.*—In their Report of April, 1902, Schimmel & Co. mentioned an oil originating from the south of France, and designated as

*Oil of Petitgrain Mandarinier* which had clearly been distilled from

the leaves, and twigs carrying unripe fruit, of the mandarin tree. They have since received from Mr. Pablo Journet, of Carcagente, a sample of a similar oil, distilled from the leaves of the mandarin tree, the yield being 1 kilo of oil from 300 to 350 kilos of selected leaves—the oil separating during the distillation into a light and heavy portion. An average sample of this oil, representing the whole distillate has a yellowish color, with a strong fluorescence, and refracts the light very strongly; its odor is somewhat like that of neroli, yet differing from the latter in a marked degree. Its specific gravity was found to be 1.0142, at 15°, and the rotatory power + 7°46′. It dissolves in 6 to 6.5 volumes 80 per cent. alcohol, and consequently does not show any material difference in its physical properties from the oil designated as petitgrain mandarinier. Like the latter, it is very faintly acid, and has a very considerable ester-content (ester number 216.23) which, however, is still higher than that of oil of petitgrain mandarinier. Oil of mandarin leaves, in accordance with these observations, appears to have a composition which is entirely different from that of oil of bergamot leaves (which see).—Schimmel's Rep., 524, Oct-Nov. 1902, 83.

*Paraguay Petitgrain Oil—Characters and Constituents.*—Schimmel & Co. give the details of a chemical examination of a sample of genuine Paraguay petitgrain oil. They observe that petitgrain oil has but rarely been examined chemically, the only fact really known hitherto concerning its composition being that it contains linalyl acetate as the principal constituent, together with limonene and geraniol—the latter both free and as acetic ester. The Paraguay oil used for the examination referred to had the sp. gr. 0.8912, optical rotation —0° 30′, and saponification number 135. At ordinary pressure it commenced to boil at 157°, at 20 Mm. pressure at 65°. The vapors of the drops first passing over gave an intense cherry-red color to a chip of pine wood moistened with hydrochloric acid (pyrrol reaction). A red color of the portions boiling at 157° to 166°, produced with fuchsine and sulphurous acid, indicated that the fraction contained aldehyde. With a solution of aniline hydrochloride in aniline, the fraction showed an intense furfurol reaction. The chemical examination revealed the presence of the following bodies in Paraguay petitgrain oil: furfurol, l-pinene (?), l-camphene (?) dipentene, an alcohol $C_{10}H_{18}O$ (l-linalool), d-terpineol (melting-point 35°), geraniol, geranyl acetate, and also traces of a basic body.—Schimmel's Rep., Oct.–Nov., 1902, 68–73.

*Oil of European Pennyroyal—Constituents.*—Petrie has examined and carefully fractioned the oil of European pennyroyal. The small quantity of first runnings was repeatedly distilled over sodium in order to isolate the terpenes, but the author did not succeed in obtaining the lowest-boiling portions free from oxygen. Up to 173° fractions more or less strongly lævorotatory passed over; the last of these fractions, of the boiling-point 170° to 173°, showed a specific rotation $[a]_D = -52° 11′$; when bro-

minated, yielded a bromide melting at 106° to 109°, which the author considers to be a mixture of the tetrabromides of l-limonene and dipentene. Treatment with amyl nitrite and hydrochloric acid produced a small quantity of a well-crystallizing nitroso chloride of the melting-point 135°. From the principal fraction boiling at 110° to 112° (at 20 Mm. pressure) menthol was produced; the separation from the pulegone was obtained by conversion of the menthol into the benzoate boiling at 190° (18 Mm.), whilst pulegone passed over at 107° (at the same pressure). By saponification of the ester a small quantity of crystallized menthol was produced in the pure state. Another method for the detection of menthol consisted in oximating the fraction containing menthol with an excess of hydroxylamine hydrochloride and oxide of zinc in alcoholic solution. Upon subsequent distillation acetoxime of the melting-point 59° to 60° passed over at 50° (20 Mm. pressure): The author assumes that this acetoxime, along with the oxime of methyl cyclohexanone, is formed by decomposition from the hydroxylamide of normal pulegone oxime. The fraction of the oxymation product boiling at 20 Mm. pressure at 100° to 120° contains the menthol, which could be obtained in crystalline form, in the pure state, by repeated distillation (boiling-point 110° at 17 Mm.). The phenyl ureth ane produced from it melted correctly at 111° to 112°. From the portions of pennyroyal oil boiling at 90° to 110° (20 Mm.) menthone was isolated by von Baeyer and Henrich's method, and identified by analysis of its semi-carbazone melting at 184°.—Schimmel's Rep., Oct.–Nov., 1902, 63; from Bull. Soc. Chim., iii, *27*, 186.

*American Peppermint Oil—Gross Adulteration.*—Messrs. Schimmel & Co. call attention to the extensive adulteration of American peppermint oil, due to the rise and fall in the prices of this article. They have examined numerous samples in their laboratory which showed pronounced differences in specific gravity and optical properties from the normal oil, but above all attracted attention by their difficult solubility. In the case of four different samples of oils examined, all of which were insoluble in 10 volumes of 70 per cent. alcohol, one in particular was grossly adulterated. It only formed a solution in 15 to 20 volumes of absolute alcohol, and on nearer examination was shown to contain 60 per cent. mineral oil.—Schimmel's Rep., April–May, 1903, 58.

*Oil of Peppermint—Adulteration with "Acetin."*—C. T. Bennett communicates the details of an analysis of a sample of peppermint oil which, judged by general appearance, odor and taste, showed no abnormal features, but on examination was found to have physical and chemical characters quite different from a pure oil. The result of this investigation proved that the oil contained a body not hitherto detected, so far as known to the author, in any essential oil. This body has been identified as purified "acetin," a mixture of the three acetic esters of glycerin. It can be produced fairly cheaply on a large scale by heating together gly-

cerin and glacial acetic acid for several hours, the commercial product being used as a solvent for indulin and other coloring-matters used in calico-printing. It usually contains free acetic acid and glycerin. It is of interest to refer to these experiments, as recorded by the author, since they show how the presence of this body effects the chemical and physical characters of peppermint, and while for this information in detail the original paper must be consulted, the following may find place here:

*Characters of the Adulterated Oil.*—The sample had only a slight yellow color and a fairly strong odor of peppermint. Its physical and chemical characters are shown by the following figures:

| | |
|---|---|
| Specific gravity at 15° C. | 0.964 |
| Optical rotation in 100 Mm. tube | —15° |
| Esters as menthyl acetate | 71.2 per cent. |
| Esters after acetylization | 53.1 per cent. |
| Refractive index at 20° C. | 1.4581 |

The oil was soluble in two volumes of 70 per cent. alcohol, but on the addition of more 70 per cent. alcohol it became turbid, and oily drops floated on standing. Acetylization decreased the apparent percentage of esters. The following tabulated results of the fractionation of the adulterated oil and comparison with corresponding fraction of pure American (Wayne county) peppermint oil will also prove interesting:

| Fractions. | Adulterated Oil. | | | | Pure Oil. (Sp. Gr., 0.911; Ref. Index, 1.4645.) | | | |
|---|---|---|---|---|---|---|---|---|
| | Quantity. | Sp. Gr. | Rotation. | Ref. Index. | Quantity. | Sp. Gr. | Rotation. | Ref. Index. |
| 1 | 12½ per cent. | 0.900 | —15° | 1.4645 | 12½ per cent. | 0.898 | —10° | 1.4660 |
| 2 | 12½ " | 0.902 | —15° | 1.4670 | 12½ " | 0.903 | —14° | 1.4635 |
| 3 | 12½ " | 0.910 | —14° | 1.4650 | 12½ " | 0.907 | —16° | 1.4645 |
| 4 | 12½ " | 0.920 | —16° | 1.4640 | 12½ " | 0.910 | —20° | 1.4640 |
| 5 | 12½ " | 0.926 | —20° | 1.4640 | 12½ " | 0.912 | —23° | 1.4615 |
| 6 | 12½ " | 0.938 | —22° | 1.4640 | 12½ " | 0.912 | —23° | 1.4615 |
| 7 | 6 " | — | — | 1.4640 | 12½ " | 0.915 | —34° | 1.4630 |
| Residue | 19 " | 1.147 | — | 1.4450 | 12½ " | 0.962 | — | 1.4790 |

It will be seen that in the case of the pure oil no portion had a sp. gr. of more than 0.962, while in the case of the abnormal oil the sp. gr. of fractions 4, 5 and 6 were distinctly higher than the corresponding fractions of the pure oil, the residue having a sp. gr. of 1.147, and a much lower refractive index than that of any normal constituent of peppermint oil. The author has made attempts to devise a ready test which might be applied by brokers in order to detect this adulterant, but has been unable at present to improve upon the Pharmacopœia solubility-test, which, however, might pass an oil containing a small quantity of acetin. The production of acetic ether in the cold on addition of alcoholic potash is characteristic but hardly conclusive, and could not easily be detected by the nose in a strong-smelling oil.—Chem. and Drugg., April 11, 1903, 591, 592.

*Italian Oil of Peppermint—Character.*—Schimmel & Co. having recently come into possession of a small parcel of Italian oil of peppermint, which is rarely exported, described it as follows: The oil (which had been distilled in the province of Piedmont) has a faint greenish-yellow color, and an odor which reminds one somewhat of pennyroyal. Its physical constants are as follows: specific gravity at 15°, 0.9122, optical rotation — 16°21′: it is soluble in about 7 volumes 70 per cent. and in 1.1 volume 80 per cent. alcohol, with considerable opalescence, which in both cases becomes gradually fainter if further quantities of the solvent are added. The oil has a total content of menthol of 52.5 per cent; of this 7.89 per cent. are esterified, and the remainder is present as free alcohol. In conformity with this low menthol-content, oil does not congeal when placed in a freezing mixture. On the other hand, it shows a fairly considerable content of menthone, viz., 22 per cent. These figures, with the exception of the menthol content, approximate to those previously given by this firm for Italian peppermint oil.—Schimmel's Rep., Oct–Nov. 1902, 66.

*Menthol—Solubility and Uses.*—Geo. Roe mentions that menthol is practically insoluble in water and glycerin, a point which should be emphasized considering how often it is prescribed to be dissolved in either or both. It is important to remember that its solubility is as follows.

Menthol, 5 gr. dissolve in 1 minim of alcohol.
Menthol, 4 gr. dissolve in 5 minims of chloroform.
Menthol, 1 gr. dissolves in 4 minims of olive oil.

As an ointment made with vaseline 5 gr. to the ounce it has been found useful. As a spray in oil (containing 15 per cent.) it has been used with success for tubercular laryngitis, and in the pill form, soap and dispensing syrups make a good mass. As menthol snuff it is now much favored for catarrh of the nasal organs.—Chem. & Drug., May 23, 1903, 812.

*Diethyl-glycocoll Menthyl Ester—A Water-Soluble Menthol Compound.*—In view of the possible clinical value of a water-soluble menthol derivative, Alfred Einhorn and Stephan Jahn have carried out a series of investigations which resulted in the production of a glycinester of menthol, the hydrochloride of which is easily soluble in water, and readily splits off menthol when introduced into the organism. This derivative is diethyl-glycocoll menthyl ester, $C_{10}H_{19}O.CO.CH_2.N(C_2H_5)_2$, which yields a crystalline hydrochloride on addition of HCl to its solution in ether. The hydrochloride forms white crystalline leaflets, melting at 108°, readily soluble in water, and having a faintly acid reaction. Pharmacological experiments show this substance to have no pronounced effect upon the heart's action when given per os or injected subcutaneously, but when injected into the veins it injuriously affects the heart's action. Furthermore, it is a kidney poison, capable of producing the death of the ani-

mals experimented on within 4 to 6 days after 1 to 2 Gm. have been administered. In such cases the kidneys are shown to be strongly inflamed. The authors have also prepared the corresponding esters of *camphor* and of *borneol*. The former produces the hydrochloride that is insoluble in water, the latter a water-soluble salt, but neither of them appears to be suitable for medicinal use.—Arch. d. Pharm., *240*, No. 9, (Dec. 27, 1902), 644–651.

*Russian Otto of Rose—Characters and Constants.*—Bertrand Fils, of Grasse, publish in their "Bulletin" an analysis of a sample of genuine otto of rose, produced in the Imperial Apanages of Kachetie (Caucasus). These figures demonstrate once more the variation which climatic and other influences have on the composition of otto of rose, and the impossibility of drawing conclusions as to what an otto distilled in one place should be from what an otto distilled in a far distant place is. The results given are as follows:

| | | | |
|---|---|---|---|
| Sp. gr. at 30° C. | = 0.8368 | Rotatory power | = −4° 16′ |
| Solidifies at | = 23° C. | Liquefies at | = 25° C. |
| Stearoptene | = 33.5% | Acid value | = 5.7 |
| Ester value | = 4.7 | Esters | = 1.66% |
| Ester value of acetylated otto | = 157.2 | Total alcohols (as $C_{10}H_{20}O$) | = 49.6% |
| Citronellol (rhodinol) | = 34% | Geraniol | = 15.6% |

—Chem. and Drugg., Dec. 27, 1902, 1055.

*Oil of Rosemary—Correction of the B. P. Constants.*—According to Edwin Dowzard the maximum specific gravity and rotation by the B. P. for oil of rosemary are too low, as a few genuine oils, noted in the following, give figures outside of the B. P. limits, viz.:

| | Sp. Gr. | Rotation (100 Mm.) |
|---|---|---|
| B. P. | 0.900–0.915 | Not more than + 10° |
| No. 1 | 0.915 | + 11° |
| No. 2 | 0.917 | + 9° |
| No. 3 | 0.917 | + 10° 20′ |

According to Parry, the limits 0.900–0.918 may be regarded as covering all genuine oils, which should be dextro-rotatory from + 1° to + 12°. —Chem. and Drug., Sept. 20, 1902, 520.

*Tuberone—Isolation and Composition.*—In 1899 A. Verley isolated from the oil of tuberose blossoms about 10 per cent. of a compound which he called "tuberone." Nothing definite has become known, however, of the properties of this body, which appears to be a ketone, and is said to have a composition conforming to the formula $C_{13}H_{20}O_2$. Messrs. Schimmel & Co. have now undertaken the examination of this body, and give some preliminary information concerning their results. The crude material employed for the examination was extract of tuberose-blossoms,

as an essential tuberose-oil is not on the market. This extract is a brown, salve-like mass, which, like all pure blossom-extracts, consists chiefly of wax and paraffin-like substances which have no value for the odor. In order to obtain from this the essential oil, 100 Gm. extract were distilled out with water vapor, whereby a milky, turbid, watery distillate was obtained. The essential oil extracted with ether from this distillate after addition of common salt, had the characteristic odor of the tuberose, and showed a distinct blue fluorescence. The latter points to the presence of methyl anthranilate, which has repeatedly been detected in flower-oils. The yield of oil only amounted to 5 Gm., but in any case the extract contains more—perhaps double that quantity—for it is a difficult matter to distil the oil out until all odor has disappeared. At 5 Mm. pressure the oil distilled from 60° to 140°. With the fraction boiling about 140°, which amounted to over 1 Gm., and in which tuberone must be present, it was attempted to produce an oxime. After boiling with alcoholic potassa and hydroxylamine hydrochloride, the odor of the fraction had undergone no change. A solid compound could not be separated from the reaction-product. The remaining 4 Gm. oil were oxidized with dilute solution of potassium permanganate, with the application of heat. The oxidation, which at first progressed rapidly, became gradually slower, and there remained at last an oil which was oxidized with difficulty, and whose odor reminded of methyl benzoate. This oil was distilled off in a current of steam. It was heavier than water, but its quantity too small to allow of an exact determination of its constants. It was shown, however, to consist chiefly of methyl benzoate, a good yield of benzoic acid being obtained when it was heated with alcoholic potassa.—Schimmel's Rep., April–May, 1903, 74–76.

*Vetiver Oil—Character and Constituents.*—P. Genvresse and G. Langlois have examined two specimens of vetiver oil, the one originating on Bourbon the other produced at Grasse. The neutral Bourbon oil had the specific gravity 0.993 (20°), the optical rotation + 23°43′ (in alcoholic solution); with the oil from Grasse the specific gravity was 1.012 (20°), and the rotatory power + 27°9′. The last-named oil had an acid reaction. When submitted to steam-distillation, only one-third of the total oil passed over, of which one part was specifically lighter, and the other heavier than water. The former consists chiefly of a sesquiterpene $C_{15}H_{24}$, vetivene, a color- and odorless liquid of the boiling point 262° to 263° (740 Mm., 135° at 15 Mm.) the specific gravity 0.932 (20°), and the optical rotation + 18° 19′. It absorbs without solidifying 4 atoms bromine, whereby it acquires a blue color. The heavier portion of the oil consists essentially of a sesquiterpenic alcohol $C_{15}H_{26}O$, vetivenol, a thickish bright-yellow odorless body with the following physical constants: boiling-point 160° to 170° (15 Mm.) specific gravity 1.011 (20°), optical rotation + 53°43′ (in alcoholic solution). When the alcohol is treated with acetic anhydride, it

forms an acetate ; anhydrous oxalic acts upon it with formation of the above-mentioned sesquiterpenic hydrocarbon vetivene. The distillation residue contains, in addition to vetivenol, an acid or mixture of acids, a white viscid mass, acquiring a brown color when exposed to the air, which yields a soluble potassium salt. The body which bears the characteristic odor of vetiver oil is an ester of this acid and of vetivenol, which is very easily saponified by water.—Schimmel's Rep., April–May, 1903, 76–77; from Compt. rend., *135*, (1902,) 1059.

*Ylang-Ylang Oil—Complex Composition.*—When in 1895 Messrs. Schimmel & Co. undertook the examination of ylang-ylang oil, only the following bodies were known as constituents of the oil: linalool, geraniol, p-cresol methyl ether, acetic acid and benzoic acid in the form of esters. Since then this firm has either proved the presence of the following important aromatic bodies with absolute certainty and isolated them, or indicated their presence as very probable: Pinene, creosol, eugenol, isoeugenol, eugenol methyl ether, benzyl alcohol, benzyl acetate, benzyl benzoate, methyl ester of benzoic acid, methyl ester of salicylic acid, methyl ester of anthranilic acid, and further, an odorless sesquiterpenic alcohol melting at 138°.—Schimmel's Rep., April–May, 1903, 78, 79.

*Oil of Ylang-Ylang—Nature of Phenolic Constituents.*—G. Darzens records experiments made to ascertain whether oil of ylang-ylang contains other alcohols, especially the lower ones of the fatty series, besides those alcohols already known. By methods explained the author obtained two derivatives of para-cresol, viz.: benzoyl-para-cresol and acetyl-para-cresol. —Chem. News, Aug. 8, 1902, 71; from Bull. Soc. Chim., (3), *27*, No. 3.

### ALCOHOLS AND DERIVATIVES.

*Alcohols—Catalytic Oxidation by the Platinum Spiral.*—In summing up the most interesting points in the catalytic action of platinum, and of porous bodies in general, on the alcohols, A. Trillat observes that the primary alcohols gave the corresponding aldehydes; the secondary alcohols, a ketone; while the tertiary alcohols gave principally the ketone immediately below formic aldehyde. Contrary to the opinion of several chemists, water is not an obstacle to the chemical phenomena due to contact action. The temperature at which oxidation by contact with the platinum spiral commences to take place is lower than 200°. In most of the cases examined, the heat given off by the oxidation of the alcohols, or by their molecular disaggregation, is capable of maintaining the platinum spiral in an incandescent state. By oxidation with platinum black, the action is less limited, and approaches that of chemical agents. In such cases, acids and ethers were obtained frequently, instead of aldehydes. The mechanism of oxidation observed is as follows: In the case of a moderate oxidation the action is limited strictly to the formation of the corresponding aldehyde with a more or less considerable proportion of acetal; at least

this is so for the first terms of the alcohols of the fatty series. A more energetic oxidation (white heat with excess of oxygen) has the effect of transforming the aldehyde into the corresponding acid, which is itself easily dissociated. As secondary products, the formation of ether resulting from the combination of the acid with the alcohol has been observed. —Chem. News, June 14, 1903, 288; from Bull. Soc. Chim., *29*, No. 1.

*Alcohols and Ethers—New Color Reaction.*—Gavard finds that when a little ether is cautiously floated on the surface of a few cubic centimeters of a 5 to 20 per cent. solution of potassium nitrite in strong sulphuric acid, an intense blue color, which pervades the whole liquid, is formed in a few minutes. This vanishes on shaking, but reappears on standing, and continues to be reproduced after many successive agitations. The reaction is best obtained between 15° and 30° C. It does not take place at — 20° C. It is obtained with many alcohols, esters, sugars and similar bodies. Liquids give the sharpest reaction. With solids, a minute particle should be floated on 1 or 2 Cc. of the reagent, and before charring can occur, 1 or 2 Cc. of water added. The color will develop on standing, but is less intense than that given by liquids.—Pharm. Journ., May 23, 1903, 700; from Journ. Pharm. Chim. (6), *17*, 374.

*Alcohol—Delicate Test for Its Presence.*—G. Argenson proposes a method for determining ethyl alcohol in dilute solutions, by which he claims that one part may be recognized in a million. The method depends on the formation of aldehyde by distilling the weak solution of alcohol with strong chromic acid mixture. If to the distillate a few drops of fuchsine solution, which has been decolorized by sulphur dioxide, are added, a violet coloration is produced, the intensity of which depends on the amount of aldehyde present. The color is then compared with a solution of potassium permanganate, the color of which is adjusted to that produced by the fuchsine reagent in an aldehyde solution of known strength. In preparing the fuchsine reagent, it is important to stop passing in sulphur dioxide as soon as a pale pink has been obtained.—Chem. News, Nov. 14, 1902, 227; from Bull. Soc. Chim. de Paris, *27* (1902), 1000.

*Alcohol—Technical Supply in Solid Blocks.*—Wilbert calls attention to the increasing use in Europe of alcohol for technical purposes. In France, the possibility of using alcohol as a source of motive power, especially for automobiles, is being actively discussed; while in Germany its use for illuminating purposes, in connection with incandescent mantles, has made considerable progress. In addition to this, several patents have been recently issued for producing alcohol practically in solid form; blocks of alcohol, or alcohol-impregnated material, being now on the market, which are convenient for heating small quantities of liquids.—Amer. Journ. Pharm., Sept., 1902, 441.

*Alcohol—Value as an Illuminant.*—L. Denayrouze gives some statistics

as to the use of alcohol as an illuminant, which has recently been rendered practicable by an increase in the efficiency of the Denayrouze lamp. Taking 1.08 Gm. of pure alcohol or 0.64 Gm. of carburetted alcohol (*alcohol carburé*) per candle hour as the consumption of this lamp, the cost is estimated at 0.00478 and 0.00298 of a penny per candle hour for these two alcohols, as against 0.01428 of a penny for petroleum. The lamp consists essentially of a wick, conducting the liquid by capillarity into a chamber where it is vaporized, the necessary heat being produced by a copper bar, which derives its heat from the lamp itself. The vapor passes through a channel into a kind of Bunsen burner, above which the mantle is fixed. The series of operation is entirely automatic.—Pharm. Journ., Sept. 20, 1902, 295; from Bull. French Phys. Soc., through Nature.

*Ethyl Iodide—Reaction with Silver Nitrate.*—E. Biron finds that in the absence of any solvent, iodide of ethyl reacts energetically on nitrate of silver, giving $C_2H_5NO_3$ in almost theoretical amount, and disengaging about 10,000 cals. It is best to pour the $C_2H_5I$ drop by drop on the powdered nitrate of silver mixed with fine sand in a cooled flask. In the presence of solvents the results are different. With alcohol, as has already been shown by Nef, we obtain, besides $C_2H_5NO$, ordinary ether, $(C_2H_5)_2O$, and nitric acid. In the presence of water there are formed $C_2H_5NO_3$, $C_2H_5OH$ and $HNO_3$. Nef explained the production of $(C_2H_5O)_2O$ by the formation of a product of transitory dissociation, $CH_3.CH$, which unites with the $HNO_3$ and the $C_2H_5OH$, giving $NO_3C_2H_5$ and $(C_2H_5)_2O$; but this explanation cannot be admitted as it presupposes a unimolecular reaction, while the measurements of the speeds show that the action of the nitrate of silver on $C_2H_5I$ and on $C_2H_5Br$ are bimolecular reactions. The formation of ether, $(C_2H_5)_2O$, and of products of saponification of nitrate of ethyl in much greater quantities than those which result from the saponification of $NO_3C_2H_5$ by water, are attributed by the author to the action of alcohol and water on nitrate of ethyl in the nascent state.—Chem. News, July 11, 1902, 24; from Journ. Soc. Phys. Chim. R., xxxii, 667.

*Ethyl Nitrite—Rate of Saponification by Water.*—In order to determine the speed of saponification of ethyl nitrite by water, E. Biron kept a mixture of water and of the ether at a constant temperature. The ether must be in excess, so that during the whole of the operation the aqueous solution of it remains saturated, and the concentration is constant. At certain intervals samples of the solution are titrated with $Ba(OH)_2$ in the presence of phenol phthalein, to determine the amount of free $HNO_3$. This was found to increase, and consequently the speed of saponification, in the ratio of the amount contained in the water. Initially, the amount of ethyl nitrite dissolved in 100 Gm. of water (between 53° and 85° C.) was 2.239 Gm. It is found that the normal nitric acid solution saponifies about 4.17 times quicker than pure water.—Chem. News., July 18, 1902, 36; from Journ. Soc. Phys. Chim. R., xxxii, 636.

*Brandies—Coefficient of Impurities.*—According to Cardoso-Pereira, the results of numerous analyses made in the municipal laboratory of Paris show that commercial alcohols and wine-brandies have average coefficients of impurity of 0.0176 to 0.5184. Other chemists have stated that the coefficients of impurity for wine-brandies is never lower than 1.300—Chem. News, Jan. 23, 1903, 48; from Compt. rend., *135*, No. 26 (Dec. 29, 1902).

*Beers—Composition of those Made With and Without Malt.*—C. L. Parsons has examined a large number of samples of American malt liquors, and of "no malt" beers. The following figures are given regarding the composition of seventy-six samples of malt liquors examined:

| | Sp. Gr. | Alc. by Vol. | Ext. | Albuminoid. (n × 6.25). | Phosphoric Acid. | Ash. | Sulphates in Ash. | Free Acid. |
|---|---|---|---|---|---|---|---|---|
| Average ... | 1.01 | 5.61 | 4.61 | 0.47 | 0.06 | 0.21 | 6.34 | 0.26 |

Approximately 50 per cent. of these malt liquors contained salicylic acid. The high percentage of sulphates, and the low specific gravity and extractive, as compared with previously-published figures, point to a much more general use of glucose than formerly existed. The considerations which warrant a chemist in pronouncing a sample of beer to have been brewed from malt rest largely on the percentage of albuminoids and phosphoric acid, but are supplemented by the general composition. The examination of a number of samples, which, though a small proportion of malt may have been used in their production, do not furnish sufficient evidence to warrant a chemist in stating that they were brewed from malt, shows the following maximum figures:

"NO-MALT" BEER.

| | Sp. Gr. | Alc. by Vol. | Ext. | Albuminoid. (n×6.25). | Phosphoric Acid. | Ash. | Sulphates. |
|---|---|---|---|---|---|---|---|
| Maximum ... | 1.01 | 2.63 | 3.53 | 0.21 | 0.23 | 0.19 | 21.22 |

It is also considered probable that a complete ash-analysis would corroborate the opinion arrived at by a consideration of the figures for albuminoids and phosphoric acid.—Journ. Amer. Chem. Soc., xxiv, 1170.

*Chloroform—Toxicological Tests.*—Spica and Todeschini conclude that Vitali's test—the green color communicated to the hydrogen flame in contact with copper gauze—although not specific, is the most delicate test for

chloroform. Other tests, in the order of their delicacy, are: Hoffmann's isonitrile reaction, Vitali's thymol test, Lustgarten's naphthol reaction. The separation of the chloroform from the suspected material by distillation is best accomplished by the heat of a boiling brine bath and preferable to distillation with steam.—Chem. Ztg., 1902, 828.

*Iodoform and Dithymol Di-Iodide—Incomplete Reaction in Customary Methods of Preparation.*—It has been pointed out by Cousin that when dithymol di-iodide (aristol) is prepared by the action of hypochlorites on alkaline solutions of thymol and an alkaline iodide, the resulting product contains notable quantities of an organic chloro-compound. F. Roques and A. Gerngross now state that the yield both of iodoform from acetone and of aristol from thymol, by this reaction, is far from being quantitative. They have examined the mother liquors, and find them to contain notable quantities of iodine in the form of iodate and periodate of sodium when excess of sodium hypochlorite is employed. The reaction appears to take place as shown by the following equation:

$$2C_{10}H_{13}OH + 5NaClO = C_{20}H_{24}O_2Cl_2 + 2NaOH + NaClO_3 + 2NaCl.$$

The sodium chlorate thus formed reacts with the potassium iodide thus by double decomposition:

$$NaClO_3 + KI = KCl + NaIO_3,$$

and the excess of hypochlorite converts this sodium iodate into periodate thus:

$$NaIO_3 + NaClO + NaOH + H_2O = NaCl + Na_2H_3IO_6.$$

In the form of periodate the iodine does not respond to the usual reactions for the metalloid until that salt has been reduced. There is, therefore, a considerable loss of iodine incurred by the use of this process.—Pharm. Journ., Nov. 1, 1902, 436; from Journ. Pharm. Chim. [6], *16*, 211.

*Aldehyde — Regular Formation by Catalytic Action of Finely Divided Metals.*—Paul Sabatier and J. B. Senderens find that the decomposition of ethyl alcohol into hydrogen and aldehyde is effected at a comparatively low temperature by means of copper. There is, in this case, no simultaneous formation of ethylene and no separation of water. The intervention of an oxide produced by reduction of water vapor is absolutely inadmissible, since there is no water vapor, and even if there were, copper at 850° would be absolutely incapable of reducing it. The authors believe that the decomposition of the alcohol is caused by the production of an unstable metallic hydride which under certain conditions provokes the hydrogenation of the products. This action is supposed to be catalytic and will act in the case of many primary and secondary alcohols.—Chem. News, April 17, 1903, 191; from Comp. rend, *136*, No. 12, (Mar. 23, 1903).

*Chloral Hydrate—Volumetric Estimation.*—In the course of experiments on the availability of the volumetric test of the B. P. for chloral hydrate, Carl G. Hinrichs found that the directions of the B. P. give results varying from 180 to 200 per cent., while understanding the term "heating" to mean warming till the odor of chloroform had disappeared. It then became necessary to make a thorough examination of the volumetric determination of chloral hydrate, trying to ascertain the influence of quantity operated on, time of reaction, temperature and strength of alkali used. The results of the author's experiments are exhibited in tabulated form and seemed at first to utterly condemn the process, but a closer study of the process convinced him that the process is very excellent if used under proper conditions, which are briefly given as follows: Dissolve an accurately weighed amount of chloral hydrate in 58 to 100 Cc. of water; run in excess of $\frac{N}{2}$ alkali (15 Cc. per gramme taken). When a turbidity due to separated chloroform is noted, swing till perfectly clear (1 to 2 minutes). Titrate back with $\frac{N}{2}$ acid. The difference is the amount of alkali used. In this way the following results were obtained:

| Wt. | Time and Temp. | Cc. $\frac{N}{2}$ alk. used. | Do. per Gramme. | |
|---|---|---|---|---|
| 0.9984 | 3 min., stir, clear. | 12.47 | 12.49 | Brand A. |
| 0.9981 | 5 min., stir, clear. | 12.39 | 12.41 | Brand A. |
| 1.0028 | 2 min., stir, clear. | 12.30 | 12.26 | Brand B. |
| 1.0146 | 2 min., stir, clear. | 12.50 | 12.21 | Brand B. |
| 0.9790 | 2 min., stir, clear. | 12.21 | 12.47 | Brand C. |
| 0.9948 | 2 min., stir, clear. | 12.32 | 12.44 | Brand C. |
| 0.9863 | 2 min., stir, clear. | 12.19 | 12.36 | Brand D. |

The theoretical amount is 12.035; while this is uniformly exceeded, it is only slightly so in the test as properly carried out, while in the test carried out under conditions approximating to the B. P., it is in many cases doubled, and in two cases it was trebled.—West Drug., April, 1903, 175-176.

*Chloral Hydrate—Use as a Blister.*—Bonnet has used chloral hydrate with advantage as a blistering agent, a layer of it being placed upon diachylon plaster and applied to the skin. A blister is then produced without discomfort after twenty or thirty minutes' application.—Pharm. Centralh.

*Amyloform* is a derivative of formic aldehyde which has for some time been used on the European continent in therapeutics to replace iodoform. It is supplied in form of a light and very fine white powder which is insoluble, may be heated to 180°C. without decomposition, and thus lends itself to complete sterilization before use. The antiseptic effects produced are extremely pronounced: it has been successfully used and is recommended for the treatment of fresh and suppurating wounds.—Pharm. Journ., Jan. 17, 1903, 62.

*Normal Butyl Alcohol— Synthesis.* — Marcel Guerbet finds that on heating a concentrated solution of barium ethylate in absolute alcohol to 230–240°, a small quantity of normal butyl alcohol is formed, and, at the same time, ethylene, hydrogen, and acetate and carbonate of barium. The concentrated barium ethylate is prepared by dissolving caustic baryta in the cold in absolute alcohol, and heating the solution to boiling-point. Ethylate of barium, which is less soluble hot than cold, is precipitated, and it suffices to decant the greater part of the supernatant alcohol to obtain a concentrated solution of barium ethylate. This solution is placed in sealed tubes, and heated to 230–240° for twenty-four hours three separate times. At the end of each twenty-four hours the tubes are opened to allow the gas to escape, then sealed up again. The gas thus produced is passed through a series of five wash-bottles containing successively water, bromine, solution of soda, concentrated sulphuric acid, and absolute alcohol; it is then collected over water. The bromine absorbs the ethylene, the soda the fumes of bromine, the sulphuric acid dries the gas, and the alcohol dissolves the methane which is formed by the pyrogenous decomposition of the barium ethylate; the residual gas is hydrogen only. The contents of the sealed tubes are distilled on an oil-bath to dryness; the distillate is rectified, and passes over between 76° and 130°; after rectifying a large number of times, a small quantity of liquid is separated at length, boiling at 115–117°; this is normal butyl alcohol, $C_4H_{10}O$.—Chem. News, Feb. 6, 1903, 71; from Bull. Soc. Chim. (3), *27*, No. 12.

*Methyl Alcohol—Method of Detection in Liqueurs.*—Sanglé Ferrière and Cuinasse propose the following method for detecting the presence of added methyl alcohol in "liqueurs," such as absinthe, vermouth, etc. The liquid is distilled, and 50 Cc. of the distillate, made acid by the addition of 1 Cc. of $H_2SO_4$, is treated with 5 Cc. of saturated solution of $K_2Mn_2O_8$. Any methyl alcohol present is thus oxidized into formaldehyde. The mixture is allowed to stand for a few minutes, when the color should be distinctly brown, without any red tinge due to excess of $K_2Mn_2O_8$. If this excess occur it must be removed by the addition of a few drops of tannin solution. The solution is then rendered faintly alkaline with $Na_2CO_3$, filtered, and treated with 2 Cc. of a 1 per mille solution of phloroglucin and 1 Cc. of strong KOH solution. In the presence of added methyl alcohol a marked red color reaction will be obtained. A faint yellowish-rose or violet color may be neglected, since alcohol derived from wine may contain a minute trace of methyl alcohol; any material addition thereof, however, in sufficient quantity to be remunerative, is at once and unmistakably shown by the test. A confirmatory reaction may be obtained with gallic acid. The alkaline filtrate obtained as described above is made acid with dilute $H_2SO_4$; a few grains of gallic acid are dissolved in the liquid and then a little strong $H_2SO_4$ is allowed to flow down the side of

the vessel so as to form a layer beneath the aqueous liquid. In the presence of formaldehyde derived from methyl alcohol a blue color will form at the zone of contact.—Pharm. Journ., April 18, 1903, 557; from Annales de Chim. Analyt., *8*, 82.

*Methyl Iodide—Value as a Vesicant.*—C. Garnier applies 2 or 3 Gm. of methyl iodide on a double-fold of filter paper, as a vesicant, and considers it to be superior to cantharides for the purpose. The part to be blistered is first washed, then rendered antiseptic with phenol or sublimate solution, and finally covered with the methyl-iodide pad, over which a slightly larger piece of gutta-percha tissue is laid, and kept in place by a piece of lint, the edges of which are fixed with collodion. After being applied for eight or ten hours, the dressing is removed, the blister opened with the customary antiseptic precautions, and dressed with boric acid vaseline. The pain occasioned by the application, although somewhat sharp at first, soon diminishes, and is succeeded by a sensation of warmth, which is not sufficiently painful to prevent sleep. With a smaller dose of methyl iodide a simple rubefacient action, without blistering, may be obtained.—Pharm. Journ., May 30, 1903, 780.

*Methyl Salicylate—Objection to its Substitution as an Equivalent for Oil of Wintergreen.*—Dr. Gustavus Hinrichs objects to the apparent acceptance in the U. S. P., of methyl salicylate as the equivalent of oil of wintergreen. He observes, that in the first place, methyl salicylate made from ordinary (synthetic) salicylic acid, which again is made from carbolic acid, is in no sense *identical* with the methyl salicylate of true oil of gaultheria; for it is not necessarily containing the pure ortho-oxybenzoic acid exclusively, to say nothing about the wood spirits used in the manufacture of the synthetic methyl salicylate. In the second place, that single one per cent. may mean much more than the small figure, as is well known to the chemist who looks at things as they are.—Proc. Mo. Pharm. Assoc., 1902. 54–57.

*Methyl-Formyl-Phenyl Acetate—Preparation.*—In the course of a study of tautomeric changes by means of optically active substances, J. B. Cohen and S. H. C. Briggs had occasion to prepare methylformylphenyl acetate by the method of Lapworth, which they describe as follows: Sodium is allowed to act on a mixture of methyl acetate and ethyl formate dissolved in dry ether. In this reaction, an interchange occurs to some extent between the methyl and ethyl groups so that some methyl formate and some ethylformylphenyl acetate are produced. The product was poured into water, the ethereal layer removed, and the aqueous portion acidified and shaken out with ether. The other was evaporated in a vacuum, and crystals of methylformylphenyl acetate separated on standing. The methyl ester thus obtained was in large, well-formed tetragonal crystals consisting of four-sided prisms terminated by pyramids; purified by recrystallization from chloroform, it melted at 82°-84°. An alcoholic solution

of ferric chloride produced a faint violet coloration in solutions of the substance in methyl and ethyl alcohol, ether, and light petroleum. No coloration was produced at first in benzin, chloroform, or ethyl acetate, but the color developed gradually. Methylphenyl acetate, obtained in the preparation of the formylphenyl acetate, is a colorless and odorless liquid which boils at 216°.—Pharm. Journ., July 5, 1902, 1; from Proc. Chem. Soc., *18*, 172.

*Sodium Methyl-Arsenate—Volumetric Method of Determination.*—The following method for the determination of crystalline sodium methyl-arsenate, $As(CH_3)O_3Na_2 6H_2O$, is recommended by E. Falières: A weighed quantity (0.2 Gm.) of the salt is dissolved in exactly 10 Cc. of water and 40 Cc. of neutral $\frac{N}{10}$ $AgNO_3$ solution is added. After agitation, the precipitate is quickly filtered out, the filtrate transferred to a burette, and run into a solution of 10 Cc. of $\frac{N}{10}$ NaCl solution, to which a few drops of neutral chromate indicator have been added. In this manner the amount of silver used up by the methyl-arsenate in a given volume of the solution is determined, and thus, by inference, the quantity of that salt present was determined. One moleculer weight of crystalline sodium methyl-arsenate, 292, is equivalent to two molecular weights, 350 of $AgNO_3$.—Pharm. Journ., July 5, 1902; from Journ. Pharm. Chim., [6], *15*, 446.

*Formaldehyde—Quantitative Estimation.*—L. Reuter finds that of all the methods used for the quantitative estimation of formaldehyde, the most rapid, most accurate, and most readily applied, is the iodine method, as recommended by Romijn, 1897. The test is carried out as follows: 20 Cc. of 35 to 40 p. c. formaldehyde are introduced into a graduated flask and distilled water added to bring up the volume to 500 Cc. Of this thoroughly mixed fluid, 5 Cc. are introduced into a bottle capable of being perfectly closed. 30 Cc. of normal soda or potassa lye are added, and then $\frac{N}{5}$ iodine solution allowed to flow in from a burette with constant agitation, until the fluid remains of a bright yellow, color (35–60 Cc.) The shaking is then vigorously continued for one minute, when 40 Cc. of normal sulphuric acid are added, and then the excess of iodine liberated, titrated with decinormal thiosulphate solution. Each Cc. of $\frac{N}{5}$ iodine solution consumed, corresponds to 0.0015 Gm. formaldehyde. Another and exceedingly simple method, which may be carried out with the apparatus to be found in the smallest stores, and is accurate with ½ p. c., is carried out as follows: Tare a small porcelain evaporation dish together with a glass rod to ½ Cgm.; weigh into a dish 10 Gm. of the formaldehyde and add so much ammonia, until the fluid has an ammoniacal odor—*i. e.*, about 20 Cc. of 10 p. c. ammonia water; evaporate on a water bath carefully to dryness, and weigh the residue. Express the weight of the latter in Cgm., and multiply by 0.1286. The result will directly give the percentage sought for. This method is based on the following reaction with ammonia: $6CH_2O+4NH_3=(CH_2)_6N_4+6H_2O$.—Pharm. Rev., May, 1903, 207–209.

*Formaldehyde—Simple Method of Titration.*—Hugo Schiff recommends the following simple method for determining formaldehyde in its solutions: Dilute 10 Cc. of the formaldehyde to 200 Cc. with water, and neutralize the solution. Dissolve 0.5 Gm. pure ammonium chloride in 3 to 4 Cc. water, add 10 Cc. of the diluted formaldehyde, and titrate with potassium hydroxide, using litmus as indicator. Each Cc. of $\frac{N}{1}$ potassium hydroxide is equivalent to 0.045 Gm. of formaldehyde—the reaction being as follows: $2NH_4Cl+3CH_2O+2KOH=N_2(CH_2)_3+2KCl+5H_2O$.—Pharm. Ztg.. 1903, 109.

*Formaldehyde—Direct Detection by Means of Amidol.*—Manget and Marion discard distillation as a means of separating formalin prior to testing for its presence, and employ amidol or amidophenol to detect that body directly in the liquid to be examined. Thus, in the case of milk, a little amidol or amidophenol is sprinkled on the surface of the liquid. If no formaldehyde be present a salmon color is developed; but, in the presence of formalin, a bright canary-yellow tint results even with 1 part in 5,000. Similarly, aqueous extract-of-meat preparations, suspected to be preserved with formalin, give the same yellow tint with these reagents, which turns to dull yellow on adding a drop of ammonia. In the absence of formalin a reddish-brown color, turning blue with ammonia, is obtained. —Pharm. Journ., Nov. 15, 1902, 491; from Comptes rend., *135*, 584.

*Paraformaldehyde—Solubility in Solutions of Sodium Sulphite.*—A. and L. Lumiere and M. Seyewetz find that there are several drawbacks to the use of formaldehyde for the insolubilization of gelatin, and the authors thought that, owing to its constancy of composition, trioxymethylene or paraformaldehyde, $(H.COH)_3$, might be used instead. For this reason they have examined its solubility in various saline solutions, and find that it is soluble in solutions of sodium sulphite; and that the maximum of solubility of paraformaldehyde is reached when its mixture with anhydrous sodium sulphite contains 30 to 60 per cent. of the latter. Thus, we can obtain solutions containing from 25 to 29 per cent. of trioxymethylene. The presence of paraformaldehyde in sufficient quantity (25 per cent.) increases the solubility of the sodium sulphite, and enables up to about 55 per cent. of this substance to be dissolved in water; the solution then contains 74 per cent. of solid matter.—Chem. News, June 5, 1903, 275; from Bull. Soc. Chim. (3), *27*, No. 24.

*Cacodylic Acid—Characters of Some of its Salts.*—G. Siboni describes the sodium, potassium, lithium, silver, calcium, barium, mercury and iron salts of cacodylic acid. Commercial sodium cacodylate is stated to contain from 2 to 3 per cent. of water. Ferrous cacodylate is readily converted into the ferric salt. Its solutions give a green color with citric acid, and on evaporation leave a residue which, after treatment with absolute alcohol to remove the acid consists of a mixture of ferrous and ferric cacodylate. By the interaction of codeine sulphate and barium cacodylate,

codeine cacodylate, $(CH_3)_2ASO.OH.C_{18}H_{21}O_3N$, is obtained as a reddish-white, crystalline, somewhat deliquescent powder, soluble in water and in alcohol, neutral to phenolphthalein, and alkaline to helianthin and litmus. —Pharm. Journ., Oct. 4, 1903, 336; from Boll. Chim. Pharm., through Chem. Centralblatt, *73* [1], 744.

*Cacodylates—Differentiation from Methyl-Arsenates.*—J. Bougault finds that the solution of sodium hypophosphite in hydrochloric acid, which he has found useful for detecting arsenic in glycerin (see under "Arsenic"), also serves to distinguish between methyl-arsenates and cacodylates, or to detect the presence of a trace of the latter in any excess of the former. If to 10 Cc. of the acid hypophosphite reagent 1 Cc. of solution containing a trace of cacodylate be added, and the tube be corked, an odor of cacodyl will be developed after a time, even 0.0005 Gm. of sodium cacodylate giving a perfectly distinct odor in twelve hours, but no precipitate of arsenic. If, however, the quantity of cacodylate be greater than the above, a deposit of arsenium is slowly formed on the sides of the tube which gradually increases in amount. Methyl-arsenates behave quite differently. They give off no odor, and the whole of the arsenium in combination is set free and precipitated at once. Consequently to detect cacodylic acid and its salts in methyl-arsenates it is only necessary to dissolve 0.2 Gm. of the salts in 10 Cc. of the reagent, corking the tube and allowing the mixture to stand for twelve hours, when if only 0.0005 Gm. of cacodylate be present a marked odor of cacodyl will be evident. To detect the presence of other arsenical compounds in cacodylates the same test is repeated again, employing 0.2 Gm. of the salt. No color or precipitate should be obtained; the presence of 0.0001 Gm. of $As_2O_3$ or $As_2O^5$ will cause a distinct brown tint or even a precipitate to appear.—Pharm. Journ., March 14, 1903, 386; from Journ. Pharm. Chim. [7], *17*, 97.

*Iron Cacodylate—A Valuable Remedy in Anæmia.*—Dr. Vangeon finds that ferric cacodylate, $Fe_2[O.As.(CH_3)_3]_6Fe_2O_3$, containing 45 per cent. of ferric oxide, and 32 per cent. of arsenic, to be a valuable remedy in the treatment of anæmia and chlorosis. The large proportion of iron present allows the compound to be prescribed in convenient doses, whereas in the ordinary combinations of iron and arsenic, the latter predominates, so that a full dose of iron cannot be given. Basic iron cacodylate is given in doses of two-fifths to one-half grain, and may be administered either by the mouth or hypodermically. In the latter case, a solution containing 3 Mgm. per Cc. should be employed. Apart from transient pain and smarting, this injection gives rise to no local trouble or constitutional disturbance.—B. M. J. Epit, Feb., 1902, 82.

*Mercury Iodo-Cacodylate—Advantage Over the Simple Cacodylate.*—It is stated in "Pharm. Ztg." (1903, 325) that injections of mercury iodo-cacodylate give similar results to mercury cacodylate when administered

by subcutaneous injection, but not to cause the pain which prevents the extensive use of the former salt in many cases where it would be useful. The injection is thus prepared: Mercury cacodylate, 1, and acid cacodylic, 2, are dissolved in water, 75; sodium iodide, 1, is dissolved separately in water, 5. The two solutions are mixed and made up to 100 fluid parts with distilled water. The solution may then be sterilized. Each Cc. contains 3 Cgm. of mercury iodo-cacodylate, which is therapeutically equivalent to 4 Mgm. of $HgI_2$. The dose is 1 Cc. to be injected daily into the gluteal region.

*Phenols—Quantitative Determination in Medicinal Preparations.*—E. Barral employs the following method for the detection of phenols in medicinal substances. A quantity of the substance, containing approximately 0.20 to 0.30 Gm. of phenols, is introduced into a 150–200 Cc. tubulated retort, with 75 Cc. of water, and 2.3 Cc. of HCl. Distillation is then conducted until 40 to 50 Cc. of distillate has been obtained. Another 40–50 Cc. of water is then introduced into the retort, and distillation repeated as before. Generally these two distillations will suffice to remove all the phenols, but to ensure this the second distillate should be set aside, and a third collected, a portion of this being tested with bromine water. If it give indications of the presence of phenol a fourth distillation will be necessary. When phenols of high molecular weight are present these may collect in the tube of the condenser or in the receiver. If this occur the sublimate must be washed down with a small jet of water. Any solid particles of phenol may be collected on a tared filter, washed with water, dried over $H_2SO_4$, and weighed. This will give the amount of insoluble phenols. The filtrate and washings from which these have been separated are then treated with excess of bromine water. After allowing the mixture to stand for twenty-four hours the precipitated bromo-phenols are collected on a tared filter. The dried precipitate is washed with a little water, dried over $H_2SO_4$, and finally weighed. The amount of bromine in these bromo-phenols is determined in the usual manner as silver bromide after heating them to redness with lime. The difference between $\frac{79}{80}$ of the weight of bromine found and that of the bromo-phenols gives the amount of soluble phenols, assuming the phenols to be precipitated as mono-bromo-phenols. This weight added to the weight of insoluble phenols gives the total phenols present.—Pharm. Journ., March 28, 1903, 458; from Journ. Pharm. Chim. (7), *17*, 98.

*Tribromophenol Bromide—Melting Point.*—F. W. Lewis finds the melting-point usually attributed to tribromophenol bromide (118°) to be much too low, and that it may be raised to 148°-149° by recrystallizing the compound from ethyl acetate; moreover, whilst as usually stated, the substance of low melting-point gives off bromine on heating at about 125°, the purified material begins to lose bromine before melting at about 154°.

The crystals of tribromophenol bromide belong to the orthorhombic system, the axial ratios being $a:b:c$=0.7945 : 1 : 1.5921.—Pharm. Journ., Jan. 5, 1902, 2 ; from Proc. Chem. Soc., *18*, 177.

*Creosote—Commercial Quality.*—John Barclay reports that in seven samples of creosote examined during the year, the specific gravity ranged from 1.081 to 1.089, and the distillation points were found to lie between 198° C. and 225° C. In other respects the samples proved satisfactory, and he again observes that the B. P. requirements in point of distillation limits are somewhat unnecessarily stringent.—Pharm. Journ., Jan. 24, 1903, 97.

*Guaiacol Ethylenate and Oleo-Guaiacol—Formation and Characters.*—In conclusion of his series of papers on guaiacol derivatives (see Proceedings 1902, 1005–1008), F. G. Ehbert gives a description of the formation, preparation, character and uses of guaiacol ethylenate and oleo guaiacol.

*Guaiacol Ethylenate* was first prepared in 1894, being formed by the action of ethylene bromide (or chloride) upon o-guaiacol in alkaline solution when these substances are used in the molecular ratio of 1 : 2. The compound occurs in fine, micro-crystalline needles of a yellowish tint, sparingly soluble in water, readily soluble in hot alcohol, melting at 138°–139° C., and devoid of taste or odor. It is recommended therapeutically in place of other guaiacol esters on the ground of its energetic action and its practically innocuous character—the dose being 0.5 to 1 Gm. in cases where guaiacol is indicated.

*Oleo-Guaiacol*, which was first made in 1892, is produced by the condensation of one molecule of oleic acid with 1 molecule of guaiacol. It has characters probably identical with those of oleo-creosote, a liquid of sp. gr. 0.9501 at 15° C., insoluble in water, almost insoluble in 90 per cent. alcohol, but freely soluble in absolute alcohol and miscible in all proportions with fixed and volatile oils, ether, benzol, chloroform, etc. Therapeutically, oleo-guaiacol possesses the advantage over guaiacol in its non-irritativeness and non-toxity.—Pharm. Rev., July and Aug., 1902, 318 and 359.

*Crude Glycerin—Criticism of Various Assay Methods.*—J. Lewkowitsch has investigated various methods for assaying crude glycerins with results which show that the bichromate-acetin method, while adapted in the case of fairly strong lyes, yields results which are too high when the lyes are impure. Zeisel and Fanto's method, based on the conversion of glycerol by hydriodic acid into propyl iodide with liberation of free iodine, also failed to give encouraging results ; while Chaumeil's method of oxidizing by iodic acid in presence of sulphuric acid has the disadvantage that all impurities oxidizable to carbon dioxide are reckoned as glycerol.—Pharm. Journ., April 18, 1903, 558 ; from Analyst, *28*, 104.

*Glycerin — Determination in Wine.*—A. Trillat gives the following method for the determination of glycerin in wines: Fifty Cc. of the wine is evaporated in a silver capsule on the water-bath at about 70° C. until the bulk is reduced to a third; 5 Gm. of powdered animal charcoal is then added, and the evaporation carried to dryness. The dry residue is rubbed down in a mortar with 5 Gm. of quick-lime. The resulting powder is transferred to a flask, and well agitated for several minutes with 30 Cc. of pure acetic ether, free from alcohol. The liquid is then decanted and filtered, the residue shaken up with another similar quantity of acetic ether. If the filtrate be not perfectly clear, it is returned to the filter until the liquid runs bright. This clear filtrate is collected in a tared capsule; when the first and second filtration is complete, the solvent is evaporated at first on the water-bath, and finally in the drying oven at a temperature of 60° C., then the clear, yellow residue is weighed as glycerin. The ash content of this glycerin does not generally exceed 1 per cent., and in ordinary circumstances may be neglected. Care must be exercised that the acetic ether employed be free from water and from alcohol.—Pharm. Journ., Feb. 14, 1903, 198; from Comptes rend., *135*, 904.

*Glycerin—Determination by Means of Iodic Acid in Place of Bichromate.*—Of the many methods for the determination of glycerin, the best for general use is that in which potassium bichromate is employed, but even this is not free from defects. A. Chaumeil now suggests that the difficulties of the bichromate method may be obviated by substituting iodic acid, which, besides being a more energetic oxidizing agent, has the advantage of not being destroyed by sulphuric acid, however concentrated the latter may be. The oxidation of glycerin by iodic acid in the presence of sulphuric acid is complete, the reaction proceeding as follows: $5C_3H_5(OH)_3 + 7I_2O_5 = 15CO_2 + 20H_2O + 7I_2$, from which it is seen that five molecules of glycerin liberate seven molecules of iodine. In making the determination, a fragment of marble is placed in the distilling flask, the $CO_2$ evolved maintains a slight pressure in the apparatus, and prevents absorption. The receiver contains potassium iodide solution, in which the iodine dissolves when it comes over. The iodine is readily determined by standard solution of sodium hyposulphite. Where the glycerin contains chlorides, the author does not eliminate the latter by a preliminary treatment with carbonate of silver, as has been recommended elsewhere, but titrates the glycerin directly, and subtracts from the volume of the hyposulphite used that accounted for by the chlorides.—Pharm. Journ., April 4, 1903, 490; from Bull. Soc. Chim., xxvii, 12.

*Glycerin Monosalicylate — Preparation and Characters.*—E. Tauber has prepared glycerin mono salicylate, first obtained by Göttig in 1877, by a simplified method, which consists in treating for forty hours, on a water-bath, 100 Gm. of salicylic acid, 300 Gm. of glycerin, and 12 Gm. of sul-

phuric acid previously diluted to 60 per cent. The pure acid is thus obtained in the form of white microscopic crystals, fusible at 76°. It is difficultly soluble in cold water, but easily in warm water or in alcohol, and is very easily saponified by alkalies—it sufficing to leave its ethereal solution in contact with anhydrous sodium carbonate to effect its saponification.—Chem. News, Oct. 24, 1902, 209; from Berichte, *36*, 1769.

*Bismuth Glycerophosphate—Preparation.*—The following process for the preparation of bismuth glycero-phosphate is given by L. Barthe: Crystalline bismuth nitrate, 97 Gm., is dissolved in a solution containing glycerophosphoric acid, 52 Gm.; the mixture being sufficiently acid to prevent the formation of a precipitate. A large excess of alcohol (95 per cent.) is then added, when a white precipitate of bismuth glycerophosphate is formed. This is washed by decantation with alcohol until free from acid reaction, then collected, drained and dried on porous tiles.—Pharm. Journ., Nov. 29, 1902, 563; from Bull. de la Soc. de Pharm. de Bordeaux, *42*, 165.

FIXED OILS.

*Fixed Oils—Microscopic Determination.*—C. Hartwich and W. Uhlmann observe that in microscopic examinations it is the practice to designate as "fixed oil" strongly refractive drops or masses, which are insoluble in water and alcohol, soluble in ether, chloroform, petroleum-ether and volatile oils, and which are colored red by alkanin, blue by cyanin and blackened by osmic acid—particular reliance being placed upon the color-reactions and on the insolubility in alcohol. The authors point out certain conditions under which these reactions may prove fallacious, and recommend as preferable to all of these the saponification method, originally recommended by Molish (1891). The reagent for this purpose is composed of equal volumes of saturated solution of potassium hydrate and of 20 per cent. solution of ammonia—the potassium hydrate solution being obtained by washing the caustic alkali with a little water, to remove a possible coating of carbonate, adding water insufficient to dissolve all of the caustic potassa and decanting the saturated solution. A drop of the reagent is placed upon the section to be examined, or upon a small drop of the fixed oil previously placed upon the object glass; it is then covered with a cover-glass and allowed to stand, when, after a greater or less time, crystals of the potassium salts of the fatty acids that may be present are developed and are readily recognized under the microscope. It thus becomes possible not only to determine the presence of the fixed oil, but distinguish non-drying from drying oils and the oils from each other—such as peach-kernel oil from true almond oil, etc., etc.—by the characteristic shapes of the crystals found. In illustration of the value of the saponification method, the authors mention that the so-called

*Gentian-root Oil*, although responding to the color reactions mentioned,

is not a saponifiable oil, but a cholesterin-like body. In this connection also the authors have made a study of the formation of

*Olive Oil*, which they find to be present at a very early stage in the development of the fruit, reaching its maximum when the fruit matures. They furthermore find that the oil is not secreted in special cells, and that contrary to the prevailing statements it is not derived from mannite, which has not been found present in the fruit at any stage of its development, but in all probability from glucose, which is found abundantly in olives, and decreases in amount as the quantity of oil increases.—Arch. d. Pharm., *240*, No. 6 (Sept. 10, 1902), 471–480.

*Fatty Acids—Compounds with Iodine and Sulphur.*—A process has been patented in Germany for preparing compounds of fatty acids with iodine and sulphur, hydrogen sulphide being passed through a solution of an unsaturated fatty acid and iodine in benzol. When combination is effected the benzol solution is washed to remove excess of iodine and hydrogen sulphide, and the benzol distilled off from a water-bath. The product, containing 12 per cent. of iodine and 2 per cent. of sulphur, forms alkali salts, which are easily soluble in water.—Chem. Ztg., 1902, 1019.

*Benne Oil—Detection in Olive Oil.*—Tambon finds that a solution of pure crystalline glucose, 3.4 Gm., in HCl, 100 Cc., forms a useful reagent for the detection of sesame oil in other fixed oils. Fifteen Cc. of the oil to be tested is shaken well for two or three minutes with 7 to 8 Cc. of the reagent, then heated until boiling commences and again shaken. In the presence of 1 to 5 per cent. sesame oil a more or less pronounced red color appears in the separated aqueous portion in a few minutes, and is permanent for a week. Olive oil gives no color.—Pharm. Journ., Jan. 31, 1903, 125; from Journ. Pharm. Chim. [6], *13*, 56.

*Butter—Use of Fluorides as Preservatives.*—See *Fluorides*, under "Inorganic Chemistry."

*Cacao Butter—Composition.*—By treating cacao butter with acetone, J. Kilmont has separated it into two parts, one readily soluble the other less soluble. On dissolving the fat in three times its weight of acetone, by means of heat, and then cooling, a portion separated out; this was found to be a mixture of palmitin and stearin, having the m. p. 64° C. On evaporating off the solvent from the mother liquor, and purifying the residue several times by recrystallization, a white body, m. p. 31.3° C., was obtained. This was identified as a triple glyceride of olein, palmitin and stearin. The compound is probably accompanied by other complex glycerides, such as those of lauric, palmitic and oleic acids.—Pharm. Journ., Aug. 2, 1902, 86; from Monatshefte für Chem., *23*, 51.

*Coco-Nut Oil—Method of Removing Acrid Taste and Unpleasant Odor.*—Paul Pollatschek communicates the results of experiments upon coco-nut oil, the fat obtained either by pressure or extraction with solvents from

the fruit of the coco-nut palm. He describes the various attempts that have been made to remove the acrid taste and unpleasant odor of this fat, and concludes that the most successful is the action of superheated steam in the absence of air. But even the fat thus purified, which is quite free from odor, gradually imparts to "margarine" containing as little as 5 per cent. of it a distinctive odor.—Ztschr. f. Nahrungs u. Genussm., *5* (1902), 1136.

*Cotton-Seed Oil—Detection in Butter by Halphen's Reaction.*—Sjollema and Tullecken find that the butter obtained from the milk of cows fed on cotton-cake yields Halphen's reaction for cotton-seed oil, but that the spectroscopic characters of the color produced are influenced by the temperature to which the liquid tested is subjected.—Pharm. Journ., Jan. 31, 1903, 126; from Ztschr. f. Nahr. u. Genussm., *5*, 914.

*Cotton-Seed Oil—Effect of Heat and Halphen's Reaction.*—E. Fulmer has investigated the effect of heat upon cotton-seed oil in its relation to Halphen's reaction. He finds that cotton-seed oil is rendered inactive to the reagent by heating to 260°–270° C., and that the intensity of the reaction is greatly diminished by heating the oil to 220°–240° C. It is, however, possible that the oil may be heated without injury to 280° C., and reasonably certain that a temperture of 220°–240° will not render it unfit as an article of food either alone or as part of a mixture. Lard from animals fed on cotton-seed meal may respond to Halphen's reagent with an intensity of coloration equivalent to several per cent. of unheated cotton-seed oil. The author concludes that though the value of the test for normal unheated oil is unquestionable, its value for diagnostic purposes is limited, especially in its application to the analysis of lard. For example, a mixture of fats or oils may be prepared containing at least 25 per cent. of cotton-seed oil which has been heated to 220°–240° C., or a much larger proportion if heated to 250°–260°, which will give a coloration with Halphen's reagent not more intense than that obtained with lard from hogs fed with cotton-seed meal.—Journ. Amer. Chem. Soc., xxiv, 1148.

*Oil of Haricot Beans—Constants.*—The fixed oil extracted by ether from haricot beans has, according to T. Kosutany, the following constants: Sp. gr., 0.967; Hehner number, 78.5; Reichert-Meissl number, 2.46; Koetstorffer number, 135.4; Hübl number, 119.4; refraction number, at 25° C., 81.5; at 40° C., 72.5; refraction number of fatty acid at 40° C., 69. At ordinary temperatures it deposits, on standing, a white precipitate, probably of tripalmitin and tristearin; the oil is at first of a bright yellow color, but becomes brown. It deepens in color on heating to 100° C., and forms a resinous mass which contains sulphur and lecithine.—Pharm. Journ., Aug. 16, 1902, 128; from Annales de Chim. Analyt., *6*, 434.

*Olive Oil—Inadequacy of the B. P. Characters and Tests.*—John C.

Umney and C. T. Bennett express the opinion that the tests of the B. P. for fixed oils are not only less perfect than they should be, but they do not compare favorably with the means of identification prescribed for other classes of drugs. In the case of olive oil it is perhaps more difficult to frame characters and tests than in the case of some others (castor oil, linseed oil) that have recently been pointed out as being inefficiently characterized, as supplies are drawn from widely different districts and prepared by somewhat varying methods. The authors review the tests that are generally applied in the examination of fixed oils, such as specific gravity, solubility, acidity, and iodine number, as well as the specific tests for the recognition of cotton-seed oil, sesame oil, and arachis oil; and they also give in the form of a table the physical constituents and behavior of virgin olive oil, sublime olive oil, fine olive oil, sesame oil, and cotton oil—these being selected as type oils—with the various reagents commonly employed for this purpose. Summarizing the results of experiments which extend over a series of examinations of a hundred or more samples of olive oils drawn from different districts, there can be no question that failure to comply with the present pharmacopœial test does not of necessity imply that the oil is adulterated, whilst certain oils unquestionably adulterated with cotton-seed oil have failed to produce the indications which would suggest impurity when judged by the British Pharmacopœial test. Finally, the authors suggest the following monograph for a future Pharmacopœia:

*Oleum Olivæ* (*Olive Oil*).—The oil expressed from the ripe fruit of *Olea europæa*—pale yellow or greenish-yellow, having a faint odor and bland, nutty taste. Sp. gr., 0.915 to 0.918 at 60° F. (1.5° C.). It becomes pasty in consistence at 32° F. (0° C.), and forms a nearly solid granular mass. Very sparingly soluble in alcohol, readily soluble in ether, chloroform, and carbon disulphide. Iodine number, 80 to 84. Five Cc. of the oil placed in a stoppered bottle with 5 Cc. amyl alcohol and 5 Cc. of a 1 per cent. solution of sulphur in carbon disulphide, and heated for an hour in a boiling saturated solution of sodium chloride should develop no reddish tinge (absence of cotton-seed oil). Ten Cc. of the oil shaken with 10 Cc. of a freshly prepared solution of pyrogallol (2 Gm.) in hydrochloric acid (30 Gm.), and the separated acid liquid heated in a water-bath for ten minutes, no distinct violet coloration should be produced (absence of sesame oil).—Trans. Brit. Pharm. Conf., 1902, 393–397.

*Olive Oil—Presence of Mixed Glycerides.*—D. Holde has obtained from olive oil a mixed glyceride of oleic and palmitic acids, having the formula $C_3H_5(C_{18}H_{33}O_2)(C_{17}H_{33}O_2)_2$, which, by the action of Hübl's iodine solution, yielded a crystalline chloro-iodine addition product. The presence of these mixed glycerides may serve to explain why oils, yielding a considerable proportion of fatty acids of high melting-point, do not solidify at correspondingly high temperatures, since these mixed glycerides remain fluid at ordinary room temperatures.—Pharm. Journ., May 16, 1903, 675; from Ber. d. D. Chem. Ges., 1902, *4*, 306.

*Olive Oil—Phloroglucin in Place of Resorcin for Determining Adulterants.*—Hans Kreis advocates the use of phloroglucin, in the solid state or in ethereal solution, to replace resorcin in Bellier's reaction for detecting impurities in olive oil. The best reactions are obtained with ethereal solutions of 1 per cent. strength; if equal volumes of nitric acid, the oil to be tested, and the ethereal solution of phloroglucin be shaken carefully, it is noticed that with oils of arachis, sesame, cotton-seeds, nuts, peach-kernels, and castor oil, the ethereal solution of the oil, which floats on the top, takes a magnificent raspberry-red coloration. In the same conditions olive oil, lard and butter oils do not give any coloration, or, at the most, a pale reddish-yellow tint. When the plan is used with oil of sesame, the acid layer takes an intense greenish-blue color, and the oil turns red. If ether be then added, the latter turns violet, then on shaking with a little water the last-named takes a deep blue color, while the ethereal layer becomes reddish-brown.—Pharm. Journ., April 4, 1903, 489; from Revue Internat. des Falsifications, February, 1903.

*Olive Oil—Phytosterol, not Cholesterol, a Constituent of the Pure Oil.*—A. H. Gill and C. G. Tufts have examined various samples of olive oil in order to establish definitely whether or not the oil contains cholesterol, the presence of which has been reported by some investigators. Experiments were made with the ordinary green oil of commerce and with an oil which had been pressed from fully-ripened olives; this latter was of known origin and quite free from adulteration. From the former oil, after several saponifications with alcoholic potash and washings, the residue was boiled for an hour with an excess of benzoyl chloride, and the product then washed with small portions of alcohol and saponified. After two recrystallizations the partially purified alcohol was boiled with an excess of acetic anhydride. On washing the resulting acetate with alcohol, and then saponifying, a crystalline substance was obtained, which consisted of the easily recognizable six-sided plates characteristic of phytosterol and of sitosterol. The pure oil was similarly treated, and various esters, such as the bromide, acetate, propionate, and benzoate were prepared. The melting-points of the alcohol and of these esters are throughout practically identical with those of phytosterol and its compounds, and quite different from the figures for cholesterol and the esters of that alcohol. The conclusion from these and other experiments is that the compound obtained from olive oil resembles the phytosterol from cotton-seed oil more than sitosterol from maize oil or from cereals, and is undoubtedly phytosterol, and not cholesterol.—Jour. Amer. Chem. Soc., *25*, 498.

*Cholesterin—New Reaction.*—L. A. Tchongaef states that the chlorides of the fatty or aromatic acids, when heated with a little cholesterin dissolved in chloroform give characteristic colorations in presence of zinc chloride. The reaction is practically utilized for the detection of cholesterin, as follows: The substance containing or supposed to contain choles-

terin is dissolved in anhydrous acetic acid; an excess of acetyl chloride and a few pieces of zinc chloride are added. The color develops on heating if cholesterin is present, and reaches its maximum intensity on boiling for five minutes over a naked flame—the solution becomes red or rose-colored, according to the amount of cholesterin present, and also has a greenish-yellow fluorescence. The reaction is much more sensitive than that of Lieberman, the color being recognizable in dilutions of 1 part of cholesterin in 80,000 parts of liquid.—Chem. News, July 18, 1902, 34; from Journ. Soc. Phys. Chem. R., xxxii, 363.

*Anthesterin—A New Phytosterin from Chamomile Flowers.*—In 1884, Naudin extracted from chamomile flowers a hydrocarbon by means of petroleum ether, to which he gave the name *anthemene*, and another body, fusible at 188° to 189°, which was not further examined. This second body has now been the subject of investigation by Prof. T. Kloff, who obtained it by treating the flowers with cold petroleum ether (35.70°) and concentrating the solution by distillation until it forms a mass of crystals on cooling, the greater part of the anthemene remaining in solution. The crude substance, which the author calls anthesterin, is converted into benzoate and the benzoate decomposed by saponification. Thus obtained, it corresponds to the formula $C_{28}H_{48}O$ or $C_{29}H_{50}O$. It is very soluble in benzene, chloroform, acetone and acetic ether, but slightly soluble in methyl alcohol. It gives the following reactions: (1) With cold sulphuric acid an orange-red coloration. (2) With sulphuric acid and 1 per cent. of nitrous acid or nitrite of sodium a red-brown color, which on contact with air turns to reddish purple. (3) On evaporating with a little hydrochloric acid and perchloride of iron, and adding chloroform, a violet coloration is obtained. (4) On dissolving in anhydrous acetic acid and adding sulphuric acid to the liquid kept cool, it gives a purple coloration like permanganate. The yield of crude anthesterin is only 2.4 to 2.7 Gm. per kilo of flowers.—Pharm. Journ., March 28, 1903, 458; from Bull. Soc. Pharmacol (5), *1*, 6–10.

*Sperm Oil—Commercial Examination.*—John Barclay reports that an examination of five samples of sperm oil gave the following average figures:

| | |
|---|---|
| Specific gravity | 0.874– 0.879 |
| Percentage of KOH for saponification | 11.78 –13.08 |
| Iodine absorbed | 76.80 –86.32 |
| Flash point | 246°–270° |
| Non-saponifiable fats | 36.08 –39.0 |
| Fat acids | 60.70 –61.68 |

—Pharm. Journ., Jan. 24, 1903, 97.

*Oil of Tomato Seeds—Constants.*—The fixed oil of tomato seeds has, according to L. Battaglia, the following constants: Water, 0.36 per cent.; iodine number, 106.9; iodine number of fatty acids, 112; insoluble fatty

acids, 95.1 per cent. Reichert-Meissl acidity, 18.93 Cc. of $\frac{N}{10}$ NaOH solution. Koetstorffer number, 190.4. Refractive index, 1.474; sp. gr., 0.922; lecithine, 2.306 per cent. It contains as well cholesterin, olein, linolein, myristicin and stearin.—Pharm. Journ., Aug. 23, 1902, 211; from Ann. Soc. Chim., Milan, through Ann. Chim. Analyt., *6*, 434.

### CARBOHYDRATES.

*Carbohydrates—Systematic Scheme for their Identification.*—The absence of a method, easy of application and yet accurate, for the identification of the various carbohydrates by pharmacists, has prompted E. H. Bartley and Jos. L. Mayer to devote some time to the subject, and as a result they offer the following simple, systematic scheme of analysis:

*Step 1.*

To 5 Cc. of a weak solution of the substance add a few drops of 15 per cent. alcoholic solution of alpha-naphthol; float this over strong sulphuric acid; a violet or blue zone at the line of contact indicates a carbohydrate.

If the substance is insoluble in water, dissolve in 25 per cent. sulphuric acid and float over this solution a mixture of water and alpha-naphthol and observe as above.

*Step 2.*

Shake about 1 Gm. of the substance with 10 Cc. of water in a test tube. Decant or filter from any insoluble residue which may be starch or cellulose. Save the filtrate for succeeding steps and test the residue as follows:

To the insoluble matter in the test tube (not on the filter paper) add a few drops of a dilute aqueous solution of iodine; a blue color indicates *starch*.

*Step 3.*

Take a portion of the filtrate obtained in step 2 and divide into two parts.

To one part add an equal volume of strong alcohol; a precipitate indicates *dextrin*.

To the other part on a white slab add a few drops of a dilute solution of iodine; a blue color indicates cooked *starch;* a reddish-brown color, *dextrin*.

*Step 4.*

Boil a portion of the filtrate obtained in step 2 with Barfoed's solution of copper acetate; a precipitate of cuprous oxide indicates either *dextrose* or *levulose*, or both.

If a precipitate, filter and use the filtrate or solution in which Barfoed's reagent produced no effect as follows:

*Step 5.*

To this filtrate or solution add an excess of solution of basic lead acetate, filter, and to the filtrate add an excess of solution of sodium sulphate to precipitate lead and filter.

To the filtrate, which must still be blue (if not, add a few drops of copper sulphate solution), add sodium hydroxide to make alkaline, and heat to boiling; a red precipitate of cuprous oxide indicates *maltose* or *lactose* or both.

Filter and save the filtrate (or the solution if no effect was produced) for step 6.

To determine whether maltose or lactose or both are present proceed as follows: Treat a small quantity of the filtrate obtained in step 2 with ammonium hydroxide in excess, add a few drops of alkaline bismuth solution and set the tube in water at a temperature of about 60° C.; *maltose* solutions reduce the bismuth, while lactose does not at this temperature within half an hour.

To detect lactose proceed as follows: To about 5 Cc. of strong nitric acid in a test-tube add about 0.5 Gm. of the original substance and warm gently until red fumes begin to come off. Set the tube in about 200 Cc. of hot water and allow it to remain there until cold; in a few hours white crystalline mucic acid separates if *lactose* is present.

*Step 6.*

To the filtrate obtained in step 5 add a few drops of sulphuric acid and boil for a few minutes, neutralize with excess of sodium hydroxide, add a few drops of copper sulphate solution and heat to boiling; a red precipitate of cuprous oxide indicates *saccharose* (cane sugar).—Drug. Circ., Feb., 1903, 28.

*Wood.*—Fire-proofing with *Aluminum Sulphate*, which see under "Inorganic Chemistry."

*Iodide of Starch—Influence of Temperature on Composition.*—L. W. Andrews and H. M. Goettsch find that clear starch solutions made at a temperature of about 150° take up in the cold an amount of iodine corresponding to the formula $(C_6H_{10}O_5)_{12}I$, while starch heated with excess of iodine to 100° for a short time takes up an amount of iodine corresponding to the formula $(C_6H_{10}O_5)_{12}I_2$. If the starch and iodine be heated to 100° until a colorless solution is obtained most of the iodine is then in the form of an organic iodide, with a smaller part in the form of hydriodic acid, while glucose is also present, but no starch. The substance known as starch iodide is regarded as a dissociable additive compound of iodine with starch molecules, more or less depolymerised, according to the temperature employed, and subject, therefore, to variation in the ratio of starch to iodine.—Pharm. Journ., Sept. 27, 1902, 316; from Journ. Am. Chem. Soc., *24*, 865.

*Gum—Formation in Sugar Cane Due to the Presence of a Microbe.*—While investigating the gummosis of sugar cane, R. G. Smith isolated from the gum of diseased stalks a microbe *Bacterium vasculosum*, Cobb, and he finds that under suitable conditions of nutrition, temperature, and

acidity, that bacterium produces in the laboratory a gum or slime which is chemically identical with the gum obtained from diseased canes. In a paper read before the Linnean Society of New South Wales, he points out that the gum is evidently not a pathological secretion of the plant, but apparently of microbic origin. For the formation of gum, saccharose or levulose is necessary; dextrose is not so useful, and the other commonly occurring sugars and carbohydrates are useless. Of the saline nutrients, a phosphate is essential; potassium can be replaced by calcium or magnesium, but sodium salts act as a decided poison to the microbe.—Pharm Journ., July 19, 1902, 43.

*Sugar Liquors—Acid Nitrate of Mercury for the Elimination of Impurities Preliminary to Volumetric Estimation.*—The analysis of sugar liquors offers certain difficulties, among which is the elimination of impurities which accompany the sugar, especially when the substances have a rotatory power, or when they reduce Fehling's Solution and decolorize or modify the color of that reagent. G. Patein and E. Dufau have made a comprehensive investigation of the methods heretofore suggested, and particularly of the objection to the reagents hitherto employed for the removal of these impurities, and recommend as most satisfactory for this purpose the employment of acid mercuric nitrate under conditions which are explained in great detail, but which must be referred to in the original paper (or its translation) in Chem. News, Jan. 2, 1903, 8–10; from Journ. Pharm. Chim., (6), xv, No. 5.

*Sugar—Detection of Minute Traces.*—Ventre-Pasha communicates a colorimetric process by which minute traces of sugar may be determined. He takes 10 Cc. of the filtered sugar solution, adds 12 drops of pure sulphuric acid, 5 drops of an alcoholic solution of nitro-benzene, 1 in 2, and 20 drops of a saturated solution of ammonium molybdate. The mixture is heated and boiled for three minutes, when a blue coloration is produced, which increases in intensity with the proportion of sugar present, and may be compared with the color obtained from a sugar solution of known strength. The best results are obtained with a solution of 1 in 10,000: 1 in 1,000 gives too deep a color, while even 1 in 1,000,000 gives an appreciable reaction.—Pharm. Journ., Jan. 24, 1903, 90; from Rev. Med. Pharm., *97*, 676.

*Fruit Sugar—A Useful Sweetening Agent in Diabetes.*—Lævulose or fruit-sugar is stated by several authorities to be a useful food in such cases where the ordinary processes of nutrition are defective, as well as affording a harmless sweetening agent for the diet of diebetics. Dr. Hall White has shown that in the latter cases, when given in moderate doses, it does not increase the amount of sugar excreted in the urine, and that some of it is retained and used up in the body. In this he has been confirmed by G. L. Peabody. Clemm and Weber have found it to be a valuable addition to the diet of tuberculous patients, Weber finding that it is oxidized much

more completely in the body than any other sugar. He claims to have cured a series of cases of initial phthisis by treatment with a lævulose diet alone. In advanced cases, the administration of lævulose was supplemented by paraffin injections with the best results. Clemm has used lævulose in the diet of scrofulous and rachitic children, in which cases he has found it to be equally serviceable.—Pharm. Journ., Nov. 29, 1902, 563; from Therapist, *12*, 146.

*Glucose—Delicate Tests for Its Presence in Urine.*—Attention is directed in "Bull. Gén. de Therap" (*114*, 348) to two convenient tests for determining sugar in urine. The first, known as

*Riegler's Test*, is carried out as follows: Twenty drops of the urine are placed in a watch glass, a trace of pure phenylhydrazine hydrochloride is added, with a little sodium acetate and 40 drops of water. The mixture is boiled over a spirit lamp, and a few drops of 10 per cent. NaOH solution are added. In a few moments a red violet color is produced in the presence of 0.1 per cent. of glucose. The second is the

*Sodium Ortho-Nitro-Phenyl Propionate Test.*—Tablets containing this compound are used as follows: 10 to 15 drops of urine are diluted with 10 Cc. of water; one of the tablets is dissolved in the mixture by heating for two to four minutes. At first the color is greenish, but in the presence of sugar this becomes a deep indigo-blue shade. The reaction is only obtainable in a large excess of the reagent, so that the saccharine solution must be very dilute.—Pharm. Journ., Nov. 29, 1902, 584.

*Gentiobiose—Preparation from Gentianose and Characters.*—E. Bourquelot and H. Herissey have previously shown that gentianose, when hydrolized, is split up into a molecule of levulose and a molecule of a new sugar, a hexobiose, gentiobiose. $C_{12}H_{22}O_{11}$. They have now succeeded in isolating this sugar in a pure crystalline condition. Gentianose was hydrolized by heating on the water-bath with 2 per cent. $H_2SO_4$, and after neutralizing with $CaCo_3$ the solution of sugars was evaporated *in vacuo*. The saccharine residue thus obtained was extracted, first with boiling absolute alcohol, then twice with alcohol. 95 per cent. to remove the levulose. The residue was then extracted with boiling methyl alcohol and the solution obtained filtered while boiling. From the filtrate crystals of what was at first considered to be the pure sugar, separated out on the sides of the vessel, in the form of semi-spherical lenticels. Subsequent examination showed, however, that these contained two molecules of methyl alcohol as alcohol of crystallization, having the constitution $C_{12}H_{22}O_{11} + 2(CH_4O)$. Purified by recrystallization from methyl alcohol this body was obtained as a white, very hygroscopic mass, with a bitter taste. Dried over $H_2SO_4$ *in vacuo*, it melted at 85–86° C. When heated it puffed, became slightly brown, again became solid, and melted again at 189–195° C. to a yellow transparent liquid. Its solution in methyl alcohol was dextrogyre, the $[a]_D = +8° 33'$ showing the phenomenon of multi-rotation, the solution which,

six minutes after dissolving, had the $a = +1° 18'$, and after three hours' standing, $a = +0.° 40'$. The two molecules of methyl alcohol were driven off by exposing the crystals to a temperature of 100–115°; the residual anhydrous sugar had the formula $C_{12}H_{22}O_{11}$. If, after removing the levulose, the residual gentiobiose be extracted with ethyl alcohol, 90 per cent., instead of with methyl alcohol, and be crystallized from the former menstruum it does not form a combination with it similar to that formed with methyl alcohol. It does not melt until heated to 190–195° C. Its solutions are dextrogyre, and show multi-rotation, but contrary to the methyl alcohol solution, these are less active when first made, being even slightly levogyre, and gradually acquiring a dextro-rotation. Thus a solution, which six minutes after solution gave the reading $a = -22'$, in twelve minutes showed $a = -12'$,, and in six hours, $a = +36'$. The $[a]_D = +9° 61'$.—Pharm. Journ., Sept. 27, 1902, 316: from Comptes rend., *131*, 290.

*Gentiobiose—Action of Ferments.*—E. Bourquelot and H. Herissey have studied the action of certain ferments on gentiobiose. They find that the ferment of aspergillus completely hydrolizes it, splitting off two molecules of glucose. Invertin is without action on it. Emulsin, which is practically without action on gentianose, rapidly hydrolizes gentiobiose. The top yeast of beer does not affect gentiobiose, but brings about the partial hydrolysis of gentianose, thus affording a means of isolating the former sugar.—Pharm. Journ., Oct. 11, 1902, 367; from Compt. rend., *135*, 399.

*Manneotetrose and Manninotriose—Two New Sugars from Manna*, which see under "Materia Medica."

ORGANIC ACIDS.

*Organic Acids—New Compounds with Lead.*—A. Colson finds that when red lead, $Pb_3O_4$, is dissolved at a temperature of 35° C., with constant agitation, in glacial acetic acid, and the filtered solution is cooled to 12° C., long, white, flattened needles are obtained which analysis shows to be *lead tetracetate*, $Pb(C_2H_3O_2)_4$. It is in fact the compound anhydride of acetic and normal plumbic acid, $Pb(OH)_4$. When treated with water it forms four molecules of acetic acid and lead dioxide, thus, $Pb(C_2H_3O_2)_4 + 2H_2O = PbO_2 + 4C_2H_3O_2H$. Except to obtain crystals, filtration after treating the $Pb_3O_4$ with acid is not necessary, since the white magma obtained is composed of almost pure lead tetracetate. In a similar manner, by dissolving the white precipitate obtained with propionic acid in excess of that liquid, long needles of *lead tetrapropionate*, $Pb(C_3H_5O_2)_4$, were obtained, also the *tetrabutyrate*, $Pb(C_4H_7O_2)_4$, with butyric acid.—Pharm. Journ., May 2, 1903, 613; from Comptes rend., *136*, 675.

*Glacial Acetic Acid—Character of Commercial Samples.*—The apparent variation in the quality of glacial acetic acid of commerce has induced P. W. Squire and C. M. Caines to subject ten samples of the acid, supplied to an order for "acidum aceticum glaciale," B. P., 1898, to tests which, with the results, are shown in the following table:

| No. of Sample ..... | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Specific gravity at 15.5° C. (= 60° F.) ..... | 1.054 | 1.054 | 1.058 | 1.060 | 1.054 | 1.055 | 1.052 | 1.057 | 1.057 | 1.058 |
| Melting-Point ..... | 15.7° C. =60.3° F. | 15.3° C. =59.6° F. | 14.6° C. =58.3° F. | 13.5° C. =56.2° F. | 12.2° C. =54.0° F. | 12.6° C. =54.7° F. | 13.5° C. =56.2° F. | 11.5° C. =52.7° F. | 11.1° C. =52° F. | 11.4° C. =52.4° F. |
| **Titration Test.** | | | | | | | | | | |
| Weight of acid taken .. . | =1.0620 Gm. | 1.0585 Gm. | 1.0600 Gm. | 1.0100 Gm. | 1.0795 Gm. | 1.0500 Gm. | 1.0600 Gm. | 1.0425 Gm. | 1.0660 Gm. | 1.0680 Gm. |
| No. of Cc. $\frac{N}{10}$ NaHO required..... | =177.6 Cc. | 177.0 Cc. | 176.0 Cc. | 167.4 Cc. | 178.4 Cc. | 174 3 Cc. | 176.6 Cc. | 171.4 Cc. | 178.5 Cc. | 174.2 Cc. |
| Weight of acid found.... | =1.05814 Gm. | 1.05456 Gm. | 1.048608 Gm. | 0.99736 Gm. | 1.06290 Gm. | 1.03848 Gm. | 1.05218 Gm. | 1.02120 Gm. | 1.06350 Gm. | 1.03788 Gm. |
| Percentage ..... | =97.7 p. c. | 99.6 p. c. | 98.9 p. c. | 98.7 p. c. | 98.5 p. c. | 98.9 p. c. | 99.3 p. c. | 97.9 p. c. | 99.8 p. c. | 97.2 p. c. |
| **Permanganate Test.** | | | | | | | | | | |
| Approximate No of Cc. $\frac{N}{20}$ KMnO, required over and above the first initial drop to 2 Cc. acid diluted *c.* 10 Cc. aq.... | nil | nil | 0.05 Cc. | 0.05 Cc. | 1 Cc. | 1 Cc. | 3 Cc. | 4 Cc. | 8 Cc. | 3 Cc. |
| **Turpentine Test.** | | | | | | | | | | |
| 5 Cc sample mixed with 5 Cc. of each of the oils of turpentine mentioned below. | | | | | | | | | | |
| A | clear | clear | clear | separated | clear | clear | clear | separated | clear | separated |
| B | clear | clear | clear | separated | clear | clear | clear | separated | clear | separated |
| C | clear | clear | clear | separated | clear | clear | clear | separated | clear | separated |
| D | clear | clear | clear | separated | clear | clear | clear | separated | clear | separated |
| E | clear | clear | clear | separated | clear | clear | clear | separated | clear | separated |
| F | clear | clear | clear | clear | clear | clear | clear | clear | clear | clear |
| G | clear | clear, | clear | separated | clear | clear | clear | separated | clear | separated |
| H | clear | clear | clear | clear | clear | clear | clear | separated | clear | separated |

With reference to the "turpentine test," it must be remarked that the authors have described the different kinds of oil of turpentine, designated by letters A–H, in a previous paper on the same test (see Proceedings, 1902, 1018). From the results shown in the table the authors conclude if glacial acetic acid is to be retained in the B. P. the melting-point should be made to agree with the other characters, as is the case in the U. S. P. —Pharm. Journ., Oct. 25, 1902, 413–414.

*Diluted Acetic Acid—Increase of Strength on Exposure.*—W. Chattaway states that when dilute acetic acid (B. P. = 4.27 per cent.) is exposed in an open vessel there is, as shown in the following table, a slight increase in the strength of the acid—proving that there is a slightly quicker evaporation of the water than of the acid. The same behavior is said to be char-

| No. of hours exposed ..... | 48 | 72 | 144 | 168 | 216 | 264 | 312 | 360 |
|---|---|---|---|---|---|---|---|---|
| Strength per cent ..... | 4.35 | 4.35 | 4.35 | 4.36 | 4.4 | 4.47 | 4.53 | 4.69 |

acteristic of *Vinegar of Squill*, and it is considered that samples of that preparation deficient in acid cannot have deteriorated as the result of exposure simply, though the development of fungoid growths in such circumstances may result in loss of acid.—Pharm Journ., Nov. 29, 1902, 551.

*Mercurous and Mercuric Acetate—Action of Acetylene.*—Burkard and Travers have investigated the compounds produced by the action of acetylene on mercurous and mercuric acetates respectively. The mercurous compound is explosive, and has the formula $C_2Hg_2.H_2O$. It resembles the acetylides of silver, copper and mercury. The mercuric compound appears to be a definite basic acetylide of the formula $3C_2Hg.2Hg(OH)_2$, and is non-explosive. Both compounds yield acetylene when treated with acids.—Proc. Chem. Soc., *18*, 183.

*Diacetyl Nitric Acid—Formation.*—Pictet and Geneguand have observed that when equal volumes of nitric acid of sp. gr. 1.4, and acetic anhydride are allowed to react, then subjected to distillation, the chief fraction coming over at 127.7° C., was found to have a composition represented by 1 mol. nitric acid and 2 mols acetic acid. To this the authors attribute the constitution of the diacetyl derivative of the ortho-nitric acid. The compound, which is a colorless fuming liquid of sp. gr. 1.197, is dissociated with water into its two constituent acids. Characteristic salts could not be prepared from it, but only a mixture of nitrates and acetates.—Apoth. Ztg., 1902, 788; from Berichte, 1902, 2526.

*Acetone Sulphite—A Substitute for Alkali Sulphites in Photography.*—Wilbert calls attention to acetone sulphite as a substitute for sodium sulphite, or potassium metabisulphite, as a preservative for photographic developers. The advantages claimed are that it may be made in solution

containing as much as 50 per cent., that it is perfectly stable, and that it keeps photographic developing solutions clear and colorless.—Amer. Journ. Pharm., Sept., 1902, 441.

*Carboxylic Acids—Synthesis.*—Houben and Kesselkaul describe the synthesis of carboxylic acids by means of the action of carbon dioxide upon the magnesium alkyl halogen compounds. Thus, as an example, ethyl bromide is treated with magnesium in the usual way and a slow stream of carbon dioxide passed in; propionic acid is easily isolated from the product, in a yield corresponding to 50 per cent. of the theoretical. Acetic, propionic, benzoic and phenylacetic acids have been synthesized in this way, so that the generality of the method is well established. —Pharm. Journ., Aug. 2, 1902, 86; from Berichte, through Nature, *66*, 308.

*Lactic Acid—Detection of Glycerin and Sugar.*—Benjamin Burkan recommends the following expeditious method of determining the presence of glycerin and sugar in lactic acid: Take one volume of suspected acid and add about ten volumes of ether; this serves to throw out of solution the glycerin or syrup because these are immiscible with ether. It also reduces the specific gravity of the lactic acid, and such a mixture, if it contains syrup, will have a milk-like color and the syrup or glycerin will settle to the bottom on standing. The upper layer of these mixtures will consist of the ether and lactic acid and the lower layer will be either glycerin or syrup. Now separate the lower layer by means of a separating funnel or pipette, etc., place it in a crucible, bring it to the boiling-point, and ignite; if it chars, it shows presence of sugar, and if it burns and leaves a black stain it shows presence of glycerin. This test has the advantage of detecting both sugars and glycerin at one operation.—Merck's Rep., April, 1903, 98

*Mercury Lactates—Preparation and Characters.*—Following the directions given by Engelhardt and Maddrel for preparing the two mercury lactates described by them in "Liebig's Annalen" (*63*, 95), Marcel Guebert found that neither of these so-called salts are definite bodies, but are mixtures. He obtains pure mercurous lactate in colorless, short, prismatic needles, not rose-colored crystals as described by Engelhardt and Maddrel, by dissolving recently precipitated mercurous oxide in dilute 1:10 lactic acid, and allowing the solution to evaporate spontaneously. The salt thus obtained has the composition, $Hg_2(C_3H_5O_3) + H_2O$. The lactic acid employed is first boiled with the water for half an hour to destroy the anhydrides which Wislicenus has shown to be present. By substituting freshly precipitated mercuric oxide, and evaporating at ordinary temperatures over $H_2SO_4$, mercuric lactate, $Hg_2(C_3H_5O_3)$, is obtained in the form of fasciated, colorless groups of prismatic needles. Although not apparently decomposed by boiling with water, the mercuric salt is reduced to the mercurous state evolving $CO_2$ and aldehyde and liberating lactic acid, as shown by the equation:

$$2Hg2(C_3H_5O_3) = Hg_22(C_3H_5O_3) + C_2H_4O + CO_2 + C_3HO_{63}.$$

This decomposition accounts for the discordant results obtained by previous investigators, who obtained their salts by boiling mercuric oxide in dilute lactic acid, crystallizing, redissolving in boiling water, and again crystallizing. Guerbet has been unable to obtain definite salts by following this method. The only lactate suitable for use in pharmacy is the mercuric salt, prepared as directed above. The commercial salt as at present met with consists almost entirely of mercurous lactate. The mercuric salt is very soluble in cold water, but undergoes decomposition in that medium on boiling.—Pharm. Journ., Aug. 2, 1902, 86; from Journ. Pharm. Chim. [6], *16*, 1.

*Citrates and Tartrates—Toxicity.*—Vietinghopf Scheel finds that neutral sodium citrate and tartrate have a powerful toxic action on frogs, mice and rabbits. The lethal dose for frogs of the citrate is 4 to 5 Mgm. for each kilo of body-weight; for warm-blooded animals the toxic dose is even less. It acts on the central nervous system and the heart. The citrate prevents the coagulation of the blood, but the tartrate does not have this effect. Neutral sodium oxalate resembles citrate in its action, but is ten times more toxic.—Pharm. Journ., Nov. 8, 1902, 463; from Archiv. Intern. de Pharm. et de Therap., through Therap,. Monats., *16*, 544.

*Calcium Citrate—Preparation for Citric Acid Manufacturers.*—In a paper read at the Agricultural Conference in the West Indies the Hon. F. Watts gave an account of the method of preparing calcium citrate for export to the citric acid manufacturers, and showed that it could be manufactured, if care were taken, so as to analyze 70.6 per cent. of citric acid. The calcium citrate is not likely, if properly prepared and dried, to lose citric acid, whereas there is a regular decrease in acid on keeping in the case of the concentrated lime juice exported for making citric acid. The points insisted on by the author were to nearly raise the juice to the boiling point, carefully neutralize with chalk, and heat until the precipitated citrate becomes crystalline, the greatest importance attaching to the proper washing of the citrate with hot water and the removal of a large proportion of the water by pressing before putting it in the drier.—Pharm. Journ., Nov. 29, 1902, 551; from Agric. News, *1*, 99.

*Bismuth Citrate—Acid Nature and Method of Preparation.*—In a previous paper Wm. Duncan had stated that bismuth citrate is more of the nature of an acid than a salt of bismuth; forming with alkalies, not double citrates, but bismuthyl-citrates, analogous to antimonyl-tartrates. In the present paper the author gives his reasons for this view and confirms his previous statements. He prepares the citrate from bismuth subnitrate and obtains it free from nitrate contamination by using excess of citric acid to ensure complete conversion of the subnitrate into citrate. Sufficient sodium bicarbonate is then added to combine with the whole of the

nitric radical, care being taken to avoid the slightest excess over the quantity required by theory for neutralization, since any excess causes a loss of three times its weight of bismuth citrate by the formation of a soluble sodium bismuthyl-citrate. Bismuth citrate prepared by the process described is very soluble in water or alcohol, but dissolves in solutions of neutral alkaline citrates, the resulting solutions having an acid reaction, and mixing with solutions of alkaline carbonates or bicarbonates without any separation of oxycarbonate.

*Tartaric Acid—Synthesis.*—Professor Zinna states that tartaric acid can be prepared by passing a current of carbon dioxide, under a pressure of about three atmospheres, over potassium glycerate, the reaction being very similar to that by which Kolbe prepared sodium salicylate. The potassium glycerate can be obtained readily by oxidizing glycerin by means of lead dioxide or minium and nitric acid, and subsequently adding potassium carbonate to the boiling solution of the lead salt.—Pharm. Journ., Aug. 9, 1902, 105; from Moniteur Scient., through Nature, *66*, 330.

*Tartar Emetic—Tendency to Lose Water of Crystallization.*—T. E. Hale finds that tartar emetic, if in fine crystalline or powdery form, loses its water of crystallization slowly in the air, more rapidly over sulphuric acid in an ordinary or vacuum desiccator, and to a slight extent upon standing in a closed bottle. At a temperature of 128°–130° C., it begins to form an anhydride, losing half a molecule of water, and at 160°–165° C., it loses another molecule of water and becomes a double anhydride. This ready tendency to lose its water of crystallization is the cause of the discrepancy between tartar emetic and arsenous oxide solution, pointed out by Gruener. —Pharm. Journ., Sept. 27, 1902, 315; from Journ. Amer. Chem. Soc., *24*, 828.

*Isopyrotartrate of Iron—A Useful Indicator.*—L. J. Simon states that isopyrotartrate of iron affords a useful indicator in the titration of acids and alkalies, being very sensitive and possessing at the same time the properties of phenolphthalein and of helianthin, its orange-yellow solution being turned violet by acids (or rose-violet by traces) and pale straw-yellow by alkalies. With phosphoric acid the violet color of the indicator is discharged when the first molecule of alkali has been used up; the tint remains orange until the second molecule of alkali has been run in, and when this has been exceeded, the tint at once changes to straw-yellow—the indicator thus serving the purpose at the same time of helianthin and phenolphthalein.

*Isopyrotartaric Acid* is obtained by the destructive distillation of tartaric acid with potassium acid sulphate, and forms with solution of ferric salts a definite crystalline compound—ferric isopyrotartrate.—Pharm. Journ., Dec. 13, 1902, 727; from Compt. rend., *135*, 437.

*Malic Acid—Isolation from Rhubarb Petioles.*—N. Castoro has isolated malic acid from rhubarb petioles by precipitating the free acid as a lead salt, and has prepared and examined both the neutral and acid strontium salt of that acid. The

*Neutral Strontium Malate* crystallizes from water in the form of fine needles, or scales, with four molecules of $H_2O$. The

*Acid Strontium Malate* was obtained in the form of fine crystals, which are soluble in hot water.—Pharm. Journ., Oct. 25, 1902, 412; from Chem. Centralbl. *73*, (1), 1399.

*Salicylic Acid—A Natural Constituent af Numerous Fruits.*—F. W. Traphagen and E. Burke not only confirm the occurrence of salicylic acid in strawberries, noted by Portes and Desmoulières, but find that it is a natural constituent of many other fruits. They find it in strawberries, raspberries, blackberries, currants, plums, black cherries, apricots, peaches, Concord grapes, crab-apples, standard apples and oranges. In a few instances the amount was approximately determined. Currants gave 0.57 Mgm. per kilo of fruit; cherries, 0.4 Mgm.; plums, 0.28 Mgm.; crab-apples, 0.24 Mgm.; and grapes, 0.32 Mgm. The fruit was distilled with phosphoric acid, the distillate extracted with ether, and the ferric chloride reaction applied to the distillate. Check-analyses with known quantities of salicylic acid with this method showed that only a portion of the acid was recovered in the distillate, so that the quantity actually present in the above-named fruits will be greater than the amount found. Journ. Amer. Ch. Soc., 1903, 242.

*Salicylic Acid—Decomposition of Aqueous Solution by Mould.*—F. E. Lott has observed that an aqueous solution of salicylic acid (0.0866 Gm. per liter) after some time grows a number of mould colonies with loss, and finally total disappearance of salicylic acid. He has not been able to grow this mould elsewhere, but believes it to be one of the Ustilagineæ. The decomposition of the salicylic acid is markedly more rapid if the solution contains a trace of ferric chloride solution. The author is now conducting experiments with stronger solutions.—Pharm. Journ., March 14, 1903, 385; from Journ. Soc. Chem. Ind., *22*, *4*, 198.

*Salicylic Acid—Return to the Colorimetric Method of Determination.*—S. Harvey states that most of the tests for the determination of salicylic acid are unsatisfactory, and he has reverted to the colorimetric method of determining the acid, but he substitutes iron alum for ferric chloride. He finds that a 1 per cent. solution is quite stable and the reaction very delicate.—Pharm. Journ., Nov. 29, 1902, 551.

*Basic Mercuric Salicylate—Medicinal Use to the Exclusion of the Normal Salt.*—H. Lajoux states that only the basic mercuric salicylate, $C_6H_4O.COO.Hg$, should be employed in medicine, and not the normal or true salicylate, $(C_6H_4OH.COO)_2Hg$. From the profound manner in which

the chemical and therapeutic activity of the mercury is modified in the former compound, the author calls this "dissimulated" mercury salicylate. Although containing 59.52 per cent. of mercury, it may be prescribed in pills in doses of ¾ to 1½ grains per diem, and even as much as 5 grains per diem may be given in certain cases and is well tolerated. Its modified therapeutic action, due probably to the phenolic character of the compound, is analogous to that of the cacodylates compared with arsenous acid. It has hitherto been generally administered by hypodermic injection, suspended in vaselin oil; but the author suggests that it should be dissolved in 4 per cent. solution of ammonium benzoate or ammonium salicylate—1 Gm. of the basic mercuric salicylate being rubbed down with 50 Cc. of the one or the other of these solutions, adding just enough dilute ammonia to effect solution, ignoring a trace of greyish insoluble matter, and then adding enough distilled water to make 100 Cc. and filtering. Being unaltered at 120° C., this solution may be sterilized.—Pharm. Journ., May 23, 1903, 700; from Journ. Pharm. Chim. (6), *17*, 438.

*Peroxide of Acetyl-Salicylic Acid—Preparation and Properties.* — A new compound, acetyl-salicylic acid peroxide, is obtained by heating acetyl-salicylic acid (aspirin) with phosphorus trichloride, dissolving the acetyl-salicyl chloride produced in acetone, and gradually adding a mixture of hydrogen peroxide and pyridine. The precipitated peroxide is collected, washed with ether, and dried. It melts at 109° to 110° C., gives a violet color with ferric chloride, and is said to be split into its constituents when introduced into the alkaline intestine.—Pharm. Ztg., 1902, 847.

*Agaric Acid—Condensation-Products with Phenetidin.*—Two new condensation-products of phenetidin with agaric acid, respectively the

*Mono- and Di-p phenetids of Agaric Acid*, have been patented in Germany, with a view to introducing them to medicinal use.—Pharm. Journ., Dec. 6, 1902, 602; from Chem. Ztg., 1902, 987.

*Cetraric Acid—Presence as such in Iceland Moss, Characters, etc.*— Dr. O. Simon confirms the occurrence of cetraric acid as such in Iceland moss (*Cetraria Islandica* Achar) as originally announced by its discoverers, Knop and Schnederman (1845), and in contradiction to the statement of O. Hesse (1890), whose experiments led him to the conclusion that Iceland moss contains another acid, *proto-cetraric acid*, which by hydrolysis splits up into fumaric and cetraric acids. According to the very comprehensive series of investigations of Dr. Simon, which are given in minute detail, cetraric acid exists in the Iceland moss in the free state. It crystallizes in colorless silky needles, having a bitter taste, odorless, and very sparingly soluble in boiling water, sparingly soluble in cold absolute alcohol, methyl alcohol, acetone and in glacial acetic acid, more readily in these solvents when heated, while ether, acetic ether, chloroform and chloride

of carbon dissolve it very sparingly even when heated, and in petroleum ether and benzol it is almost insoluble under the same conditions. On the other hand, it is readily soluble in pyridine, cold or warm. It is also dissolved by solutions of ammonia, soda and potassa, forming yellow to yellow-brown solutions, which deepen in color on standing, while solutions of sodium and potassium bicarbonate dissolve it with a faint yellowish color, depositing after a time the corresponding salts of cetraric acid in form of delicate white needles, or as globular aggregations of such. Cetraric acid is a stable body, has the composition corresponding to the formula $C_{20}H_{18}O_9$, and is decomposed without melting when heated between 200° and 230°. Dr. Simon has also obtained a second acid, which he isolated from the ether extraction of the drug, and has named

*Protocetraric Acid*—But this is not to be confounded with the product of Hesse, which appears to be a mixture of this acid, of cetraric acid, and of fumaric acid. Protocetraric acid has a composition corresponding to the formula $C_{19}H_{16}O_9$, but evidently requires further investigation.—Arch. d. Pharm., *240*, No. 7 (Oct. 25, 1902), 521–560.

*Phospho-Mannitic Acid—Preparation, Characters and Salts.*—L. Portes and G. Prunier have prepared phospho-mannitic acid by the following process: Mannite, 564 Gm., dissolved in boiling water, 500 Gm., is treated with phosphoric acid (1.750), 475 Gm., and the mixture is maintained in an oil-bath, at a temperature of 120°–125° C. for seven days. The mass is then cooled and dissolved in water. The solution is precipitated with basic lead acetate solution until a distinctly alkaline reaction is reached; the precipitate is washed, collected and drained. About eight washings are requisite to remove all traces of acetic acid and mannite. It is then suspended in 4 liters of water and decomposed with a current of $H_2S$, and the lead sulphide is removed by filtration. Excess of $H_2S$ is removed from the filtrate by passing a current of air through the solution. An excess of recently-precipitated pure barium carbonate is then added, and when all $CO_2$ ceases to be evolved, the liquid is saturated with baryta water until faintly alkaline to phenolphthalein. The precipitate is then filtered off and washed, the filtrate treated with dilute sulphuric acid to liberate the phospho-mannitic acid; this is again treated with excess of $BaCO_3$, which is left in contact with the acid for several days with occasional agitation. The precipitate is again removed by filtration, and the barium phosphomannitate precipitated from the filtrate by adding three times its volume of alcohol, 90 per cent. The flocculent precipitate thus obtained is collected, washed with alcohol, 60 per cent., and dried at 45–50° C. The pure

*Barium Phospho-Mannitate* ($BaPO_4.C_6H_{13}O_5$) thus obtained, forms a white, slightly crystalline powder, which is very soluble in cold water, partially decomposed by hot water, insoluble in alcohol, ether, fatty and essential oils. From its solution various salts of phosphomannitic acid

may be obtained by double decomposition with soluble sulphates. All these are practically amorphous except the magnesium salt. By decomposing the barium salt with a molecular weight of sulphuric acid, phosphomannitic acid may be obtained in the form of a colorless, gummy, very hygroscopic mass. It is not stable; even when its solutions are evaporated *in vacuo* traces of phosphoric acid are liberated. It is a dibasic acid, forming acid and neutral salts. Phosphomannitates differ from phosphates in giving no precipitate with ammonium molybdate and magnesium mixture; with silver nitrate the precipitate obtained is soluble in excess of $HNO_3$, and that obtained with lead acetate is soluble in acetic acid.—Pharm. Journ., July 12, 1902, 21; from Journ. Pharm. Chim. [6], *15*, 457.

*Ipecacuanhic Acid—Chemical and Pharmacological Properties.*—T. Keinura has isolated ipecacuanhic acid and investigated its chemical and pharmacological properties. He finds that it has scarcely any astringent action or any influence on the development of the bacillus of dysentery; it is difficult, therefore, to understand the reputation that de-emetinized ipecacuanha possesses as a remedy for dysentery. The chemical examination of the acid indicated it to be a glucoside allied to quillajic acid, but as it does not induce hæmolysis or possess the property of frothing, it cannot be regarded as a true saponin.—Pharm. Journ., June 27, 1903, 867; from Arch. intern. de Pharm. et Thérap.

*Tannin—Conversion into Gallic Acid by a Fungus-Culture.*—Dr. Calmetto states that tannin may be completely converted into gallic acid by introducing into its solution a pure culture of a fungus—*Aspergillus gallomyces.*—Amer. Journ. Pharm., Sept., 1902, 446; from Ztschr. f. angew. Chem., 1902.

*Rhubarb Tannin—Crystalline Constituents.*—See *Rhubarb*, under "Materia Medica."

## ORGANIC BASES.

*Alkaloids—Solubilities in Different Solvents.*——W. Müller has determined the solubility of a number of alkaloids in different solvents by agitating the powdered alkaloid with the solvent for three hours at 18°–22° C., then evaporating a weighed quantity of the solution and weighing the residue. The results are tabulated as follows, the figures indicating the parts by weight of solvent necessary to dissolve one part by weight of the alkaloid:

| Alkaloid. | Ether Sp. gr. 0.720. | Ether Sat. with Water. | Water Sat. with Ether. | Benzol Sp. Gr. 0.885. | Chlorof. Sp. Gr. 1.487. | Acetic Ether Sp. Gr. 0.900. | Pet. Spt. B. P. 59–64° C. Sp. Gr. 0.663. | $CCl_4$ Sp. Gr. 1.599. | Water. |
|---|---|---|---|---|---|---|---|---|---|
| Aconitine, amorph. .. | 69.4 | 58.9 | 570.4 | <1 | <1 | <1 | 4237.9 | 50.2 | 1845.7 |
| Atropine, cryst. ..... | 45.3 | 26.95 | 67.5 | 25.05 | 1.47 | 25.8 | 1211.7 | 151.2 | 56.1 |
| Brucine, cryst. ..... | 133.5 | 1446.1 | 467.4 | 90.1 | <1 | 23.5 | 1140.5 | 1286.4 | 1775.8 |
| Quinidine, cryst. .... | 128.8 | 61.4 | 3247.7 | 40.8 | <1 | 56.8 | 4155.3 | 177.0 | 4943.0 |
| Quinine hydrate (6.37 $H_2O$)..... | 61.7 | 17.8 | 1497.8 | 486.9 | <1 | 21.5 | 9750.7 | 491.6 | 175.2 |
| Quinine, anhyd. ..... | 114.2 | 35.8 | 1176.9 | 58.8 | <1 | 40.5 | 4729.3 | 189.0 | 1975.7 |
| Cinchonidine, cryst. . | 474.5 | 191.3 | 3266.3 | 1010.2 | 10.75 | 330.0 | 2103.1 | 1967.0 | 3918.8 |
| Cinchonine, cryst. ... | 1000.8 | 811.4 | 3985.1 | 1834.8 | 143.3 | 1390.0 | 2985.9 | 2770.0 | 4182.6 |
| Cocaine, cryst. ..... | 8.62 | 2.94 | 394.4 | 1.0 | <1 | 1.69 | 42.2 | <1 | 563.3 |
| Colchicine, amorph... | 796.2 | 554.2 | 8.3 | 106.5 | <1 | 74.5 | 1737.1 | 829.6 | 10.4 |
| Hydrastine, cryst. ... | 197.3 | 125.9 | 2608.8 | 11.25 | <1 | 24.7 | 1366.1 | 810.9 | 3000.0 |
| Hyoscyamine, cryst.. | 49.5 | 25.55 | 32.0 | 130.0 | <1 | 20.4 | 1018.8 | 1722.7 | 281.5 |
| Morphine, cryst..... | 7632.1 | 10622.0 | 2239.0 | 1599.1 | 1525.5 | 537.2 | 1170.7 | 6396.4 | 3532.8 |
| Strychnine, cryst..... | 2317.4 | 1951.7 | 6023.3 | 129.9 | <1 | 507.0 | 10715.5 | 632.0 | 4804.2 |

These figures, while possibly not absolutely correct, have an important bearing on the starting-out process in alkaloidal assays. The following solvents are suitable for removing the alkaloids named from their aqueous solvents:

*Acetic Ether:* For aconitine, atropine, brucine, quinine hydrate, cocaine, hyoscyamine, morphine.

*Benzol:* For aconitine, atropine, quinidine, cocaine, hydrastine, strychnine.

*Ether* (saturated with water): For quinine hydrate, cinchonidine, cinchonine.—Apoth. Ztg., 1903, 208.

*Alkaloids, Etc.—Color Reactions.*—Edsel A. Ruddiman has collected and arranged systematically the color reactions given by alkaloids and other substances, with a long list of reagents. The present instalments give those of the following substances: Aconitine, atropine, beberine, berberine, brucine, caffeine, chelidonine, cinchonidine, cinchonine, cocaine, colchicine, coniine, curarine, emetine, geissospermine, gelsemine, hydrastine, hyoscine, hyoscyamine, jervine, morphine, narceine, narcotine, nicotine, papaverine, physostigmine, pilocarpine, quinidine, quinine, sabadilline, staphisagrine and strychnine.—Drug. Circ., May and June, 1903, 95–97 and 119–123.

*Alkaloidal Assays—Use of a Cotton Filter for Separating Immiscible Liquids.*—Prof. A. B. Stevens calls attention to the following expedient for separating immiscible (emulsionized? Rep.) liquids: The orifice of the separator is loosely filled with absorbent cotton, through which the lower liquid is drawn off. It comes through perfectly clear, even though the original liquid was quite cloudy. The cotton not only acts a filter, but it prevents the liquid which naturally adheres to the tube from dropping out of the separator.—Pharm. Rev., Oct., 1902, 465.

*Alkaloidal Assay—Comparative Value of Different Methods in their*

*Application to Certain Drugs and Preparations.*—Prof. H. Beckurts communicates the results of a series of assays of drugs and their preparations by different processes, which may thus be compared with one another—the final determination of the alkaloid being volumetric and in accordance with the Pharm. Germ. Most of the processes employed have been described in previous reports, or are available in this literature, and can only be briefly indicated in this abstract, but may also be referred to in the author's original paper, in "Apoth. Zeitung" (*18*, 67), or in the copious abstract published in the "Pharm. Journal" (Feb. 28 and Mar. 21, 1903, 267 and 425). It may be mentioned also that in the final volumetric determination of the alkaloids, iodeosin was used as indicator in all cases except in that of cinchona alkaloids, for which haematoxylin is recommended.

*Aconite Leaves.*—Four methods were employed: (*a*) Extraction by Redwood's method; alkaloids shaken out with chloroform. (*b*) Extraction by Redwood's method; alkaloids shaken out with ether-chloroform, as in the process of Schweissinger-Sarnow. (*c*) Extraction with acidulated water; alkaloids shaken out with chloroform. (*d*) Digestion with acidulated water; alkaloids shaken out with ether-chloroform.

The results may be tabulated as follows:

| Process. | (*a*) | (*b*) | (*c*) | (*d*) |
|---|---|---|---|---|
| | Per cent. | Per cent. | Per cent. | Per cent. |
| Yield of alkaloid (1) | 0.375 | 0.372 | 0.40545 | 0.3882 |
| Yield of alkaloid (2) | 0.3882 | 0.428 | 0.44 | 0.4313 |

*Aconite-Root.*—In addition to the four methods employed for aconite herb, the process of the German Pharmacopœia was also tried and is designated as (*e*) in the following tabulated exhibit of the results:

| Process. | (*a*) | (*b*) | (*c*) | (*d*) | (*e*) |
|---|---|---|---|---|---|
| | Per cent. | Per cent. | Per cent. | Per cent. | Per cent. |
| Yield of alkaloid (1) | 0.615 | 0.647 | 0.6642 | 0.625 | 0.621 |
| Yield of alkaloid (2) | 0.621 | 0.6125 | 0.7074 | 0.6146 | 0.640 |

Other investigators have obtained percentages of alkaloid from aconite roots varying as follows: 0.6 to 1.24; 0.87 to 1.23; 1.54; and 1.28.

*Aconite Extract* (? Rep.) was assayed by two processes, (*a*) Beckurts', and (*b*) Schweissinger's, with the following results:

(*a*) Two different samples yielded respectively 3 1056 and 3.7785 per cent. of alkaloid.

(*b*) Two determinations of one extract gave 4.2702 and 4.85 per cent. of alkaloid.

*Belladonna Leaves.* — Five processes of assay were tried, of which three, (*a*), (*b*), (*c*), were the same as the corresponding processes for aconite leaves; (*d*) by percolation, after Dunstan and Ransom; and (*e*) Keller's process modified. The results are exhibited in the table:

| Process. | (*a*) | (*b*) | (*c*) | (*d*) | (*e*) |
|---|---|---|---|---|---|
| Yield of alkaloid..... | Per cent.<br>0.50864<br>0.48263<br>0.47974<br>0.50575<br>0.51422 | Per cent.<br>0.4585 | Per cent.<br>0.4932 | Per cent.<br>0.4364 | Per cent.<br>0.523<br>0.516 |

Belladonna leaves have been found to vary from 0.2 to 0.6 per cent.

*Belladonna Root* was assayed by the same processes as those described under the corresponding letters for *belladonna* leaves, with the following results:

| Process. | (*a*) | (*b*) | (*c*) | (*d*) | (*e*) |
|---|---|---|---|---|---|
| Yield of alkaloid ..... | Per cent.<br>0.56644<br>0.58956<br>0.52309<br>0.5202<br>0.51422 | Per cent.<br>0.5163 | Per cent.<br>0.5319 | Per cent.<br>0.5404<br>0.5316<br>0.53754 | Per cent.<br>0.5433<br>0.5317 |

Percentages heretofore recorded by different investigators of belladonna root are: 0.03 to 0.32; 0.60 to 0.70; 0.35 to 0.39; 0.66 to 0.67; 0.14 to 0.70; 0.509 to 0.859.

*Belladonna Extract* was assayed by the same methods as those employed for *aconite* leaves. The results were practically identical, viz.: (*a*) 1.47968 per cent; (*b*) 1.46425 per cent. The lowest percentage recorded by other experiments was 0.786; the highest 2.45 per cent.

*Cinchona Bark* was assayed by three methods; (*a*) Haubensack's; (*b*) Keller's; (*c*) the German Pharm., with results given as follows:

(*a*) *Red bark* gave 6.935, 7.22, 6.84 and 7.355 per cent.
*Brown bark* gave 2.965 and 2.925 per cent.

(*b*) *Red bark* gave 7.040, 7.19, 7.08, 6.97 per cent.
*Brown bark* gave 2.944 and 3.001 per cent.

(*c*) Both barks gave results practically identical with those obtained by Keller's method (*b*).

*Cinchona Extract Aqueous* was assayed by four processes: (*a*) Beckurts'; (*b*) Schweissinger Sarnow's; (*c*) E. Dieterich's; (*d*) the German Pharm.— with results as follows:

(*a*) yielded 7.529, 7.775, 7.920, 7.475 and 7.45 per cent.

(*b*) yielded 6.4 and 6.2 per cent.

(*c*) yielded 5.9 and 6.625 per cent.

(*d*) yielded 6.6, 6.9, 6.82, and 6.3 per cent.

*Hemlock Herb* was assayed by two methods; (*a*) digestion with acidulated water and shaking out with ether-chloroform; (*b*) extraction with alcohol and shaking out with ether-chloroform. The results were as follows:

(*a*) yielded 0.0402, 0.0317 and 0.03386 per cent.

(*b*) yielded 0.03175, 0.0349 per cent.

*Hemlock Extract* was assayed (*a*) by Schweissinger-Sarnow; (*b*) by E. Dieterich's process, with the following results:

(*a*) yielded 0.636 from one, and 0.4953 per cent. from a second sample. (*b*) yielded 0.6604 and 0.6985 from the first, and 0.4826 and 0.4953 per cent. from the second sample.

*Henbane Herb* was examined by the same process as those adopted for belladonna—the letters in the following table corresponding with the process there indicated:

| Process. | (*a*) | (*b*) | (*c*) | (*d*) |
|---|---|---|---|---|
| | Per cent. | Per cent. | Per cent. | Per cent. |
| Yield of alkaloid..... | 0.07803 | 0.08862 | 0.0771 | 0.09826 |
| " | 0.09537 | 0.07321 | 0.07128 | |
| " | 0.0867 | | 0.0722 | |
| " | 0.08959 | | | |

The author calls attention here to the unusually high percentages reported by Schmidt (0.2762 and 0.2861) and particularly of Caesar and Loretz (*2.625*, *2.687* and *2.019!*)—percentages which are quite inconsistent with the doses of the galenical preparations as compared with the alkaloidal content and doses of the corresponding preparations of belladonna.

*Henbane Extract*—Two different extracts yielded by Beckurts' method 0.8092 and 0.786 per cent. of alkaloid respectively. A purchased extract gave by the Schweissinger-Sarnow method 1.0982 per cent.; and various extracts yielded by the Germ. Pharm. method 0.92, 0.99, 1.00, 0.583 and 0.56 per cent. of alkaloid.

*Ipecacuanha* was examined by three methods: (*a*) Keller's, with final titration; (*b*) the same process as that used for aconite leaves designated (*a*), and (*c*) the Germ. Pharm. process. The results are given as follows:

(*a*) Yield from four samples of *Brazilian* drug:

| (1) | (2) | (3) | (4) |
|---|---|---|---|
| 2.2352 per cent. | 2.390 per cent. | 2.106 per cent. | 3.297 per cent. |
| 2.4536 " | 2.309 " | 2.006 " | 2.370 " |
| 2.174 " | 2.3876 " | | |
| 2.194 " | 2.2656 " | | |

Yield from three samples of *Carthagena* drug.

| (1) | (2) | (3) |
|---|---|---|
| 2.086 per cent. | 1.903 per cent. | 2.513 per cent. |
| 2.045 " | 1.944 " | 2.557 " |

Yield from one sample of *Singapore* drug:

2.086 per cent. and 2.106 per cent.

(*b*) Four assays of one sample gave 2.286, 2.2606, 2.3368 and 2.3114 per cent., while the results of

(*c*) indicated 2.2, 2.25, 2.19 and 2.1 per cent. respectively.

*Nux Vomica* was subjected to four different processes: (*a*) Extraction by percolation with diluted alcohol and shaking out the extract with chloroform; (*b*) like (*a*), but extraction by digestion instead of percolation; (*c*) Keller's method; (*d*) Germ. Pharm. process.

(*a*) Yielded 2.395 and 2.38 per cent.

(*b*) Yielded 2.2568, 2.271, 2.125 and 2.05752 per cent.

(*c*) Yielded 2.1112, 2.184, 2.1694 and 2.2568 per cent.

(*d*) Yielded 2.08, 2.2, 2.19 and 2.12 per cent.

The percentages of alkaloids found heretofore in nux vomica by different investigators are: 3.15 to 5.34, 1.84 to 2.76, 2.176 to 2.384, 2.64 to 2.885 and 2.73 to 3.15 per cent.

*Stramonium Leaves.*—The first four methods employed are the same as those described under the corresponding letters for aconite leaves; the fifth (*e*) is Keller's method. The results are as follows:

(*a*) Yielded 0.3179 per cent.

(*b*) Yielded 0.3083 and 0.3198 per cent.

(*c*) Yielded 0.3622 and 0.393 per cent.

(*d*) Yielded 0.3323 and 0.3382 per cent.

(*e*) Yielded 0.375 per cent.

Other experimenters have recorded from 0.225 to 0.4 per cent. of alkaloid in stramonium leaves.—Apoth. Ztg.

*Morphine—Inefficiency of the Silver Nitrate Method of Determination.*—G. Heyl has made a series of experiments upon pure morphine sulphate to determine the practical possibilities of the method of Reichard for the determination of morphine depending upon the reduction of silver nitrate. The results of the author's experiments are exhibited in several tables

showing the effect of aqueous solutions of silver nitrate and ammoniacal silver nitrate, under varying conditions of time, temperature of reaction, proportion of reagent to morphine, etc., and prove that the method does not give quantitative results, even with pure morphine, and is therefore not available for its determination in opium.—Pharm. Ztg.. 1903, 37.

*Morphine—Oxidation of Ferments.*—According to the observations of J. Bougault, the juice of *Bussula delica* has the property of oxidizing morphine and its salts into

*Oxy-morphine* (*Dehydromorphine*), identical in every respect with that produced by the action of potassium ferrocyanide on morphine in alkaline solutions. On allowing 100 Cc. of the juice to act on 2 Gm. of morphine hydrochloride dissolved in 50 Cc. of water, the solution soon becomes turbid, and in a few days deposits a crop of crystals of oxy-morphine hydrochloride. The action is complete in ten days, the mother liquor then containing no trace of morphine.—Pharm. Journ., July 26, 1902, 66; from Compt. rend., *134*, 1361.

*Acid Tartrate of Morphine—Characters and Composition.*—During the preparation of various batches of "Injectio Morphinæ Hypodermica, B. P.," the attention of A. E. Tanner was drawn to the incomplete solution of commercial samples of morphine tartrate. Investigation proved this to be due to the presence of acid tartrate of morphine, as shown by the following experiments:

(*a*) The precipitation by an excess of tartaric acid of a moderately strong solution of the tartrate, washing and drying the salt so produced in a desiccator over $H_2SO_4$.

(*b*) Combination of morphine alkaloid and tartaric acid in equal molecular weights.

Both the salts so produced crystallized well from hot aqueous solution, and possessed the same crystalline form, viz., rosettes of long acicular crystals. On exposing the salt to a temperature of 100° C., it was found to be anhydrous. Determination of the morphine showed a content of 65.55 per cent., agreeing with the formula $C_{17}H_{19}NO_3$, $C_4H_6O_6$, while that of the neutral salt is $(C_{17}H_{19}NO_3)_2C_4H_6O_6$, $3H_2O$. The acid tartrate requires at least 100 parts of cold water for solution, and is insoluble in alcohol. The subject is an extremely interesting one, for it is probable that many other alkaloids form sparingly soluble acid tartrates under similar conditions; for example, strychnine will be found to behave in the same way.—Pharm. Journ., Jan. 31, 1903, 134.

Referring to the preceding, J. Rutherford Hill calls attention to the fact that it is well known that alkaloids form sparingly soluble acid tartrates analogous to ammonium tartrate. The acid tartrate of morphine was first described by Arppe, and reference is made to it and its sparing solubility in a paper read by D. B. Dott twenty-two years ago (see Proceedings,

1883, 269). It is said to have the formula $C_{17}H_{19}NO_3,C_4H_6O_6.\frac{1}{2}H_2O.$, and that it is liable to be formed and deposited from solutions of the neutral tartrate when long kept.—Ibid., Feb. 7, 1903, 178.

*Morphine and Hydrastine—Value of "Lloyd's Reaction."*—The characteristic violet-blue color which is yielded by strychnine when the latter is treated with potassium bichromate and sulphuric acid is also produced when these reagents are added to a mixture of morphine and hydrastine, a fact discovered by Prof. John Uri Lloyd, and utilized by him in his novel, "Stringtown on the Pike." According to the investigations of Seward W. Williams (see Proceedings, 1901, 885), this color reaction of morphine is developed with a mixture of hydrastine and sulphuric acid alone without the presence of potassium bichromate, and Williams proposed that this simple reaction for morphine should be known as the Lloyd reaction. A detailed study of this reaction and a partial investigation of the action of these reagents with other alkaloids has also been made by Dr. Joseph L. Mayer (see Proceedings, 1902, 1039), in whose opinion "Lloyd's reaction, on account of its sharpness and its ease of application, is worthy of a place among the alkaloidal color reactions." Albert A. Wangerin has now made a series of experiments, the results of which are exhibited concisely in the form of a table. These show that the Lloyd reaction yields only a pale and indistinct pink to dark violet color with very small quantities of morphine and hydrastine. When the quantity of either or both alkaloids is increased the reaction becomes more distinct, though the particular shade of color produced varies as the proportions of the respective alkaloids vary to each other, being sometimes bluish-pink, then brownish-violet, or again bright reddish-violet, etc. The author's own observations lead him to the conclusion that the reaction is not really characteristic except with from 0.005 to 0.01 Gm. of morphine, and 0.002 to 0.005 Gm., or even 0.015 Gm. of hydrastine. The correct color tone with these quantities is from pale reddish-violet to a bright violet-red with a more or less bluish-violet tone in the outer layers. As has been already ascertained by J. L. Mayer, this coloration is somewhat more permanent than the similar reaction of strychnine, but after 15 or 20 minutes the color begins to fade out on the edges, and after the lapse of a few hours turns to a more or less greenish or olive hue. In toxicological analyses morphine is not obtained in the degree of purity in which it was used in the reactions above described, and the Lloyd reaction is therefore interfered with. Furthermore, the quantity of alkaloid available for this particular test in toxicological research is often smaller than 0.005 Gm., and is therefore insufficient to cause a sharp, clearly defined reaction. Finally, it is not often the case that both alkaloids are present in the requisite proportions to produce a proper color. On all of these grounds, therefore, the author does not consider the Lloyd reaction as available in toxicological analyses for the identification of hydrastine or

of morphine. If, however, considerable quantities of these preparations are to be identified as morphine or as hydrastine, the use of the Lloyd reaction is to be highly recommended. It also seems to be well suited for a lecture demonstration.—Amer. Drug., Feb. 9, 1903, 66; from Pharm. Ztg., Jan. 21, 1903.

*Heroine and Morphine—Comparison of Properties and Reactions.*—F. Zernik observes that the color reaction and reducing properties of morphine are in many cases dependent upon the presence of the phenolic hydroxyl groups in the morphine molecule. In heroine the hydrogen of these groups is replaced by the acetyl group $CH_3CO$—heroine being diacetyl morphine, hence the two substances show certain differences in their reactions, although they are so closely related. He finds that heroine melts at 170° C., and its hydrochloride at 232°–233° C., these figures differing slightly from those given by other workers. Heroine can be extracted from alkaline solutions by agitation with ether, whereas morphine is extracted only by amyl alcohol or ethyl acetate. In various reactions which entail the use of strong hydrochloric or sulphuric acid the two alkaloids show a similar behavior, probably because the heroine is hydrolized and yields morphine, which responds in the usual manner. Heroine gives no coloration with ferric chloride, and does not reduce potassium ferricyanide or iodic acid, since these reactions depend upon the presence of the hydroxyl group. In nitric acid, specific gravity 1.4, heroine dissolves with production of a yellow color, passing on warming to a greenish-blue, which afterwards fades to yellow. This appears to be the most characteristic reaction, since it is not given by morphine, codeine or any other alkaloid. Goldmann's reaction depends upon the presence of the acetyl groups, and is carried out by heating the alkaloid with dilute sulphuric acid and then with alcohol; the acetic acid resulting from the hydrolysis gives ethyl acetate, recognized by its odor, with the alcohol.—Pharm. Journ., May 9, 1903, 642; from Ber. d. d. Pharm. Ges., 1903, *2*, 65.

*Heroine—Characteristic Reaction with Nitric Acid.*—In a review of the literature on the physical and chemical properties of heroine, F. Zernik, after mentioning a number of reactions that are similar to those given by morphine, calls attention to its behavior towards nitric acid, which has been found specific and characteristic for heroine, either in the form of the free base or as hydrochloride. If a few drops of 65 per cent. nitric acid are added to a trace of heroine, the latter is rapidly dissolved, producing a yellow solution which changes gradually (or rapidly if heated) to a greenish-blue—the change apparently proceeding from the middle of the liquid. The color then gradually fades until the liquid has again acquired a bright yellow color.—Amer. Journ. Pharm., June, 1903, 287; from Ber. d. d. Pharm. Ges., 1903, 65.

*Apomorphine—Constitution.*—R. Pschorr, with B. Jarckel and H. Fecht,

have endeavored to solve the problem of the constitution of apomorphine by attacking it from the chemical side. They obtained by the Schotten-Baumann method a di-benzoyl derivative, a result which is in contradiction to Dankwortt's conclusion that apomorphine contained only one hydroxyl group, because he only obtained a mono-acetyl apomorphine. It contains a tertiary nitrogen atom, the iodo-methylate having been prepared by Hoffmann's method, and the di-methyl apomorphine iodo-methylate by the action of potassium hydroxide splits off tri-methylamine, while a phenanthrene compound is also obtained which may be oxidized by potassium permanganate to di-methyoxy-phenanthrene carboxylic acid. From these results, it is concluded that apomorphine is a phenanthrene-quinoline derivative.—Pharm. Journ., May 9, 1903, 641 ; from Berichte, 1902, 4377.

*Apomorphine—Detection in Morphine Hydrochloride.*—According to Helch the delicacy of the usual test for apomorphine in morphine hydrochloride is materially increased by substituting 5 per cent. potassium bichromate solution for the potassium carbonate generally employed. This brings about an immediate oxidation of the apomorphine, so that on shaking out with chloroform a marked red coloration is obtained with as little as 0.05 Mgm. of apomorphine in 5 Cc. of 30 per cent. morphine hydrochloride solution. Not only is the reaction sharper with potassium bichromate than with potassium carbonate, but it is immediate. Pharm. Centralh., 1903, 95.

*Apocodeine—A Possible Hypodermic Purgative.*—Dr. W. E. Dixon, calling attention to the desirability of hypodermic purgatives, reviews a number of medicaments that produce purgation when administered subcutaneously. He finds that while many of them produce more or less pronounced peristaltic action, they are not available for the purpose, either because of local irritation produced when introduced under the skin, or on account of other untoward effects. The drugs of the morphine series appear however to be promising for this purpose, *apocodeine* being particularly suitable, because it lowers blood pressure, produces vaso-dilatation, and increases peristaltic movements—all probably as a result of its sedative action on sympathetic inhibitory ganglia. It does not produce vomiting or give rise to other ill-effects, and the author suggests that a 1 or 2 per cent. solution of *apocodeine hydrochloride* is worthy of trial in doses of 2 or 3 Cc. The solution should be neutral and filtered before use.—Pharm. Journ., Oct. 25, 1902, 412 ; from Br. Med. Journ., Oct. 18, 1902, 1244.

*Narceine—Modification of Arnold's Test.*—Wangerin modifies Arnold's test for narceine as follows : From 0.01 to 0.02 Gm. of resorcin, 10 drops of $H_2SO_4$, and a few milligrammes of narceine are placed together in a watch-glass and warmed on the water-bath. A bright, persistent, red color appears, ultimately changing to orange in ten or twelve hours. By substi-

tuting tannin for resorcin in the above test, a green color is obtained. On cooling and adding water, the color is discharged, but reappears on the addition of ammonia. Narcotine and hydrastine are the only other bases which give this green reaction with $H_2SO_4$ and tannin. Other alkaloids are colored brown, except veratrine, which gives with $H_2SO_4$ alone a fine red color.—Pharm. Zeit., *47*, 916.

*Hydrastinine—Distinctive Reaction.*—A. Jorissen finds that the salts of hydrastinine may be distinguished from those of most other alkaloids by the powerful reducing action they exert on Nessler's Solution. The addition of a few drops of the reagent to an aqueous solution of hydrastinine hydrochloride is sufficient to produce an immediate black precipitate of mercury. Morphine and apomorphine are the only other bases, which, as might be expected, act in a similar manner, effecting more or less reduction. Among the glucosides, picrotoxin causes immediate reduction of Nessler's reagent, in the cold.—Pharm. Journ., May 30, 1903, 755; from Annales de Chim. Analyt., *8*, 127.

*Neutral Quinine Hydrobromide—Properties.*—O. Hesse, in view of the difference of the description of neutral quinine hydrobromide by several authorities, has reinvestigated the properties of this compound, which he finds to be as follows: Neutral quinine hydrobromide has the composition $C_{20}H_{24}O_2N_2.HBr+H_2O$; it is hygroscopic, may be dried at 50° to 55° C., but loses its water of crystallization at 100° C. It requires 55 parts of water at 15° C. for solution, but dissolves in an equal weight of boiling water, and is readily soluble in alcohol or chloroform, sparingly only in ether.—Pharm Centralh. 1902, 534; from Sudd. Apoth. Ztg., 1902, 621.

*Atropine Methylbromate—Advantages over the Alkaloid.*—It is stated in "Journ. Pharm. d'Anvers," (*59*, 22) that atropine methylbromate, while possessing the mydriatic and anhydrotic action of atropine, has markedly less influence on the heart than that alkaloid. It occurs in white crystalline lamellæ, which are soluble in water and in dilute alcohol. Two drops of a 1 per cent. solution dropped into the eye produce dilatation of the pupil, which disappears in four hours. It is also given in a pill containing $\frac{1}{10}$ grain, at night to check the excessive night sweats of phthsis.

*Atropine-Alkyl Nitrates—Advantage over Ordinary Atropine Salts.*—Bayer & Co. claim that the atropine-alkyl nitrates possess an advantage over ordinary atropine salts in that the dangerous effects upon the central nervous system are diminished, while the peripheral actions are maintained.

*Atropine-Methylnitrate* may be obtained by adding silver nitrate to an aqueous solution of atropine-methyl iodide, filtering out the precipitated silver iodide, and evaporating the filtrate *in vacuo* to crystallization. —Pharm. Journ., Feb. 21, 1903, 233.

*Strychnine—Quantitative Determination in Admixtures with Brucine.*—

H. M. Gordin has tried Keller's method for the separation of strychnine from brucine on known mixtures of the pure alkaloids, but finds that he can recover only 96 per cent. of the strychnine. Keller's method consists in dissolving the mixture of alkaloids in 10 per cent. sulphuric acid, adding one-tenth the volume of nitric acid, sp. gr. 1.42, and digesting for one hour and a half. The mixture is then made alkaline with ammonia and shaken out with ether-chloroform, which takes up strychnine only, the brucine having been converted into non-basic bodies by the action of the nitric acid. The author gives the details of a number of experiments which show that this loss is due to the action of the nitric acid on the strychnine itself, but that if weaker acid is used and the time of digestion shortened, the results are satisfactory and within the limits of experimental error. The author also recommends the use of soda in place of ammonia for alkalizing the acid mixture, since the strychnine extracted is much purer and cleaner than when ammonia is employed ; also the use of chloroform in place of ether-chloroform, the latter fluid always dissolving more of the aqueous fluid with traces of alkali which remain in the alkaloidal residue after its evaporation. The following method is recommended as giving good results : Dissolve 0.2–0.3 Gm. of the alkaloidal mixture in 15 Cc. of 3 per cent. sulphuric acid on a water-bath, add 3 Cc. of a previously prepared and cooled mixture of equal parts nitric acid (sp. gr. 1.42) and water, and allow to stand exactly ten minutes. Make the liquid strongly alkaline with caustic soda, and shake with three successive portions of chloroform. Filter the chloroform, evaporate in a tared vessel, and weigh. The strychnine so obtained is very pure and may be determined, if preferred, volumetrically by titration with $\frac{N}{10}$ acid, using haematoxylin as indicator.—Arch. d. Pharm., *240*, No. 9, Dec. 27, 1902, 641–644.

*Strychnine—Separation from Brucine and Quantitative Estimation.*—Briefly reviewing the methods of Dunston and Short, of Lyons, of Keller, and the modification of the latter by Gordin, for the separation of brucine from strychnine, F. J. Smith recommends Gordin's modification (which is described in detail in Proceedings, 1902, 336–342). He has applied this method to mixed alkaloids obtained from the soft solid extract, powdered extract and fluid extract of nux vomica, and to the powdered seeds from which these were made, with the results shown in the following table :

| | Mixed Alkaloids by Titration. | Strychnine. | Proportion of Strychnine in Total Alkaloids. |
|---|---|---|---|
| Powdered extract nux vomica ... | 19.9 per cent. | 7.96 per cent. | 40 per cent. |
| Soft extract nux vomica ..... | 15.1 " | 6.64 " | 44 " |
| Powdered nux vomica seeds..... | 2.9 " | 1.27 " | 44 " |
| Fluid extract nux vomica ..... | 1.96 " | 0.88 " | 45 " |

This separation of the strychnine from the brucine depends upon the destruction of the latter by nitric acid, the mixed alkaloids in dilute sulphuric acid solution being exposed to the action of a mixture of equal parts of strong nitric acid and water for exactly ten minutes, then immediately rendered alkaline with sodium hydrate and shaken out with chloroform—all of this, of course, with the definite quantities and directions of the modified method.—Amer. Journ. Pharm., June, 1903, 253–257.

*Strychnine Cacodylate—Value in the Treatment of Phthisis.*—Among the salts of cacodylic acid which have been employed in the treatment of tuberculosis, that of strychnine has been employed as a subcutaneous injection by Eysséric. It is reported to cause a marked improvement in the appetite of patients treated with injections, the initial dose of which was 2 milligrammes, increased daily by 1 or 2 milligrammes, until 10 or even 20 milligrammes were administered. Although subcutaneous administration was followed, there is no reason why the remedy should not be given by the mouth. Marked increase in weight followed the use of the drug. The maximum progressive dose given was 35 milligrammes, which showed no signs of toxic action. Generally, however, the dose of 20 to 30 milligrammes for men, or 10 to 20 milligrammes for women, should not be exceeded.—Pharm. Journ., Dec. 13, 1902, 642; from Bull. Comm., *30*, 339.

*Strychnicine—A New Alkaloid from the Leaves of Strychnos Nux Vomica.*—Dr. M. G. Boorsma has detected and isolated from both fresh and dried leaves of *Strychnos Nux-vomica* a new alkaloid, which he has named strychnicine. It is obtained by heating an alcoholic extract of the leaves with water, adding acetate of lead, removing the lead by the addition of hydrogen sulphide, separating the liquid and partly evaporating, washing with benzol, making alkaline, and shaking out the free alkaloid with benzene. The benzene solution is extracted with water acidulated with hydrochloric acid, the solution rendered alkaline, and the alkaloid again shaken out with benzene. It is then boiled with water acidulated with ½ per cent. of tartaric acid, filtered hot, concentrated, and allowed to crystallize. The strychnicine tartrate being much less soluble in cold water than the corresponding salts of strychnine and brucine, the separate crystals of strychnicine tartrate are recrystallised from hot water until free from strychnine and brucine. The free alkaloid can be obtained from a hot solution of the tartrate after rendering it alkaline by shaking out with benzene. It can also be separated from the strychnine and brucine tartrates out of water containing 0.5 per cent. of tartaric acid by benzene, although not easily and imperfectly soluble. One kilogramme of the fresh leaves yielded 100 Mgm. of strychnicine. It forms crystalline needles, which contain no water of crystallization. At 100° C. it does not lose weight, at 240° C. it begins to become brown, and at a higher temperature forms a dark mass. Strychnicine is, proportionately to the other alkaloids of nux

vomica, slightly poisonous; 2 to 5 Mgm. of the hydrochloride injected under the skin of a frog caused gradual paralysis of the limbs, but half-an-hour later the animal recovered and no symptoms of poisoning remained. The new alkaloid has been found in young as well as in old leaves, in ripe fruit pulp, in the hard fruit shell, as well as in the thin orange epidermis which covers it. The bark and wood of the twigs do not contain it. Hooper found only brucine in the leaves, and Flückiger considered the fruit shell to contain no alkaloid. The seeds of nux vomica from the Buitenzorg botanic gardens yielded no strychnicine, although powdered nux vomica seed obtained in commerce afforded a small quantity of it. The leaves of the *Strychnos tieute* yielded strychnine and strychnicine, but no brucine. The percentage of strychnicine in the young leaves was found to be less than in those of nux vomica, in which also strychnine is only sparingly present. The author describes the reactions of the new alkaloid as follows: Strychnicine gives a coloress solution with concentrated sulphuric acid, which on heating becomes yellowish. This solution does not become colored by the addition of potassium bichromate or permanganate, chromic acid, cerium oxide, ammonium vanadate, or ferricyanides. Fröhde's reagent gives a colorless solution, which on long standing becomes blue. Nitric acid gives a permanent light yellow color. Zinc chloride does not, as it does with brucine, give a violet color. With concentrated hydrochloric acid it gives a colorless solution, which after boiling with a little nitric acid gives a yellowish red color. The most characteristic reaction for strychnicine is that given by soda or baryta. A neutral or weak acid solution of the chloride or nitrate gives, on the careful addition of sodium or barium hydrate solution, a white precipitate soluble in excess of the precipitant, the solution gradually becoming of an orange color which, on acidulating the solution, becomes a purple violet color, becoming gradually more intense. Sulphuric, phosphoric, acetic, and tartaric acids do not give the same reaction. The reaction is tolerably delicate, a 0.01 solution of strychnicine giving a colorless solution when the hydrochloric acid is added to the sodium or barium hydrate solution, which becomes distinctly violet after half-an-hour. Strychnine and brucine do not essentially hinder the reaction.—Pharm. Journ., July 26, 1902, 65; from Bull. de l'Inst. Bot. de Buitenzorg, No. 14.

*Mixed Alkaloids of Ipecacuanha—Identification by the Psychotrine Content.*—After reviewing the more recent work on the alkaloids of ipecacuanha by Paul and Cownley, Alfred H. Allen and G. E. Scott-Smith communicate the nature of some investigations made concerning the color tests that have been proposed for the identification of the individual alkaloids—emetine, cephaeline and psychotrine—and in this connection particularly the reaction of these alkaloids with Fröhde's reagent as applied and described in the paper on the "Assay of Ipecacuanha" by G. Frericke and N. de Fuentis Tapis (which see p. 766). While the last named observers

generally confirm the observations of Paul and Cownley, stating that both emetine and cephaeline dissolve in Fröhde's reagent almost without coloration, but that the addition of a trace of sodium chloride or hydrochloric acid immediately produces an intense indigo-blue coloration in the case of cephaeline, but not with emetine, they appear to have actually dissolved the alkaloids in excess of Fröhde's reagent, which is a very objectionable method, since it results in the destruction of the delicacy of the reaction. In the experience of Allen and Scott-Smith, when a drop of Fröhde's reagent is applied to an alkaloidal residue on porcelain, emetine gives a dirty green color, but this is changed by addition of a minute quantity of hydrochloric acid to a fine grass-green. Cephaeline gives a purple coloration, instantly changed by the addition of hydrochloric acid to a magnificent Prussian blue. Psychotrine gives a dull purple with Fröhde's reagent, changed by hydrochloric acid to a pale green. Opium alkaloids when similarly treated give the characteristic purple on addition of Fröhde's reagent, but this color fades on the addition of hydrochloric acid. The mixed alkaloids from ipecacuanha give the Prussian blue reaction of cephaeline with great distinctness on addition of hydrochloric acid. This is a readily applied and highly characteristic color reaction for mixed ipecacuanha alkaloids, and one which distinguishes them quite sharply from opium alkaloids. A most valuable means of detecting ipecacuanha alkaloids, however, consists in the production of psychotrine in a crystallized form. Paul and Cownley describe the crystals as well-defined transparent prisms of a pale lemon-yellow color. As obtained and observed by Allen and Scott-Smith under the microscope, psychotrine forms very minute crystals, which appear to belong to the regular system. Many of them appear to be octahedra, and closely resemble microscopic crystals of arsenous oxide. Other crystals present a remarkable resemblance to granules of rice starch. Crystals of psychotrine for microscopic observation are readily obtained by shaking out an amylic alcohol or chloroform solution of the alkaloid with a little dilute acetic acid. The acid liquid is separated, concentrated if necessary, and placed in a watch-glass, or, preferably, on a microscope slide furnished with a cell. A watch-glass or small beaker is then moistened internally with ammonia and inverted over the alkaloidal acetate solution. After a time the vapors of ammonia are absorbed and liberate the alkaloid in characteristic crystals, which are observed under the microscope. There is no occasion to employ pure psychotrine for the purpose, the crystals being readily obtainable from the mixed alkaloids of ipecacuanha.—Pharm. Journ., Nov. 29, 1902, 552–553.

*Alkaloids of Ipecacuanha—Therapeutic Action.*—C. Lewin finds that the toxic symptoms developed by cephaeline closely resemble those of emetine. Both irritate the mucous membrane, but the subcutaneous connective tissue is not irritated by contact with either. Both bases are cardiac poisons, but emetine has a much more marked action on the heart

than cephaeline. Cephaeline acts more on the kidneys. The lungs show no abnormal changes after death from emetine poisoning, but with cephaeline slight extravasation of blood may occur. Cephaeline is undoubtedly the better emetic, while emetine is the better expectorant.—Pediatrics, 15, 120; from Archiv. Intern. Pharmacodyn.

*Cocaine—Incompatibility with Borax.*—Bache states that the precipitation of the alkaloid in dispensing prescriptions containing borax and cocaine hydrochloride may be prevented by the addition of a few grains of boric acid. The precipitate formed is at once redissolved. This simple and unobjectionable expedient has previously been recommended by Thibault.—Pharm. Journ., Sept. 27, 1902, 322; from Répertoire [3], 14, 392.

*Caffeine—Improved Process of Determination.*—Katz proposes the following process for the determination of caffeine, which he prefers to those of Dieterich, Keller or Beiller: 10.0 Gm. of the substance are shaken for half an hour with 200.0 Gm. of chloroform and 5.0 Gm. of ammonia, filtered, and 150.0 Gm. of the filtrate distilled to dryness. The residue is taken up by 5.0 Cc. of ether, and 20.0 Cc. of 0.5 per cent. hydrochloric acid, the acid liquid exhausted with chloroform or by perforation, and the chloroformic solution, which is filtered if necessary, evaporated to dryness and weighed. For maté the process has to be modified. In this connection the author describes a

*Perforator*, which is constructed after the pattern of the Soxhlet extractor. The syphon tube, however, is made 8 Mm. in diameter, so that it acts no longer as a syphon, and by the introduction of a glass spiral the drops of chloroform are made to traverse the liquid slowly, thus thoroughly exhausting it. Ztschr. Œster. Apoth. Ver., October, 1902, 1113.

*Caffeine-Sodium Cinnamate—A Substitution for Caffeine Sodium Salicylate.*—G. Grigg's suggests the use of caffeine-sodium cinnamate as a diuretic instead of caffeine-sodium salicylate, being free from ill-effects on the heart and kidneys. It is obtained by dissolving caffeine, 10.6, and sodium cinnamate, 8.5, in warm water, 40, filtering the warm solution, and evaporating it to dryness. An amorphous, odorless, bitter powder, having an alkaline reaction, and soluble in two parts of water results.—Pharm. Ztg., 1903, 900; from Boll. Farm. Chim.,

*Theobromine—Presence in Cacao and Kola Leaves.*—J. Dekker has examined very young, moderately old, and old cacao leaves, and found that they all contain theobromine, but that the quantity of that alkaloid present diminishes as the age of leaves increases; thus, very young leaves yielded 0.5 per cent., moderately old ones 0.29 per cent. and very old ones only a trace. Hence the alkaloid appears to be produced in the young leaf more quickly than it is used or transported. The method employed was that with magnesia, the base obtained by evaporating the chloroform

being purified by redissolving and evaporating. Similar conditions were found to obtain with kola leaves, the old containing only a trace of alkaloid, whilst young leaves yielded 0.15 per cent. In this case the alkaloid proved to be a mixture of caffeine and theobromine in the proportion of about one part of the former to two of the latter. This, if substantiated, would be very interesting, as kola seeds contain traces only of theobromine. —Schweiz. Wochenschr. f. Chem. u. Pharm., Nov. 29, 1901, 569.

*Theophylline—Manufacture on a Large Scale by Simple Synthesis.*—Dr. Hugo Schweitzer, in a paper read before the New York Section of the American Chemical Society, calls attention to the successful manufacture of theophylline by simple synthesis, an accomplishment which is due to the successful synthesis of the bodies belonging to the purin class, and is remarkable from the fact that, although vegetable bases and alkaloids had been previously produced—coniine by Ladenborg, trigonelline by Hantzsh, and cocaine by Willstaetter—a complete synthesis like that of theophylline has not hitherto been accomplished on a commercial scale. Theophylline, which is isomeric with theobromine, is present in tea leaves in exceedingly small quantities, and was first extracted by Kossel in 1888. Its production in commercial quantities has enabled the study of theophylline from a therapeutic standpoint, which reveals that it is the most powerful diuretic of this class of vegetable alkaloids. The manufacturers have, however, found it expedient to introduce their synthetic theophylline under the name of

*Theocine*, in order to distinguish it from the natural product, because it is intended to be used in medicine, and there are to-day any number of physicians who still think that synthetic products do not possess the same medicinal properties as the natural bodies. The physical and chemical characters of "theocine" are described as follows: Theocine appears in the form of beautiful, colorless needles, having a melting-point of 268° C. It is difficultly soluble in cold water and alcohol, insoluble in ether. It is, however, more soluble in cold water than theobromine, dissolving in the proportion of 1 to 179 parts as compared with 1 to 1600. Theocine forms salts, some of which dissolve readily while others are sparingly soluble. Clinical experiments, recorded by Prof. O. Minkonski, in "Therapie der Gegenwart," prove synthetic theophylline to be of particular value in dropsical conditions due to affections of the heart, liver and kidneys. In most cases the daily quantities of urine excreted under its influence ranged from 3,000 to 5,000 Cc.—in one remarkable case the increase noted was from 1,300 Cc. to 7,600 Cc.—in cases which had not yielded to other remedies. —Amer. Journ. Pharm., January, 1903, 27–30.

*Theophylline—Toxity.*—Chevelier, discussing the physiological activity of of theophylline, or theocine, says that while the diuretic action of this substance has been sufficiently demonstrated, its toxic action should not be

lost sight of. The toxic dose of theophylline for one kilo of animal weight has been determined to be 0.10 Gm. for a guinea pig (intraperitoneal) and 0.20 Gm. for a dog (intravenous). It is said to have a marked action on the heart.—Amer. Journ. Pharm., June, 1903, 288; from Les Nouv. Rém., 1903, 76.

*Anagyrine—Physiological Action.*—A writer in "Archiv. Internat. de Pharm. et Therap.," finds that anagyrine, the alkaloid of the leaves of *Anagyris fetida*, although chemically related to cytisine, has a totally different toxic action. The lethal dose for frogs is 1 Mgm. Cats and rabbits are much more tolerant of the poison. 63 Mgm. per kilo of body-weight does not produce death. It acts as a paralysant, and produces none of the strychnine-like tetanic symptoms observed with cytisine.—Pharm. Journ., Nov. 22, 1902, 523; from Therap. Monats., *16*, 532.

*Colchicine—Fatal Poisonous Dose.*—The "Lancet" (*164*, 1254) states that a case has been recorded in France of the death of a man who had suffered from gout and nephritis, and was ordered to take daily eight capsules, each containing a quarter of a milligramme of colchicine. Hoping to cut short the attack, the patient was given twelve capsules (3 milligrammes) in an hour, and died with some symptoms of colchicine poisoning. The case shows that colchicine should be given carefully to the gouty, whose kidneys are often diseased.

*Ephedrine—Chemical Relations and Constitution.*—Emerson R. Miller communicates the results of a series of investigations undertaken with the object of determining the chemical relations and constitution of ephedrine, the alkaloidal constituent of *Ephedra officinalis*. This alkaloid was first isolated by Nagai in 1878 from the species of *Ephedra* named, and in 1888 also by E. Merck from *Ephedra vulgaris*, var. *helvetica;* the latter subsequently obtaining from an unnamed species of *Ephedra* a second base, isomeric with ephedrine and named by him *pseudo-ephedrine*. Ephedrine has furthermore been the subject of investigation by Takahashi and Miura, Ladenburg and Oelschlagel, while Spehr (1891) obtained from *Ephedra monastachia* a third crystalline base, melting at 112°, to which he assigns the formula $C_{13}H_{19}NO$. For his preliminary experiments the present author endeavored to isolate ephedrine from *Ephedra vulgaris*, var. *helvetica*, but obtained instead of the alkaloid sought its isomer, pseudo-ephedrine. His investigations were therefore confined to the alkaloid obtained from ephedrine hydrochloride supplied by the firm of E. Merck. This salt when dried at 100° had the m. p. 216°, which was not changed after recrystallization from absolute alcohol. Analysis gave figures which agree with the formula $C_{10}H_{15}NO.HCl$. The free alkaloid was obtained by triturating this salt with the calculated quantity of sodium carbonate and a little water, shaking out the mixture with ether and evaporating the ethereal solution. It was so obtained as a syrupy liquid which congealed to a crystalline mass, having a strong alkaline reaction; readily

soluble in water, alcohol, ether and chloroform, and melting, after drying over lime, at 40°. Its reactions with hydroxylamine, and of the hydrochloride with phenylhydrazine proved that the alkaloid did not contain either a ketone or an aldehyde group; it yields, however, a mono-acetyl derivative when its hydrochloride is acetylized with acetic anhydride, while the free base gives a dibenzoyl compound with benzoyl chloride. By its reaction with methyl iodide it yields two methyl derivatives, methyl-ephedrine and methyl-ephedrine iodomethylate. These results prove that ephedrine contains a hydroxyl and an NH group, and that it must be considered a secondary base is shown by its behavior to methyl iodide.—Archiv. d. Pharm, *240*, No. 7 (Octob. 25, 1902), 481–498.

*Isopyroine.—A New Base from Isopyrum Biternatum.*—G. B. Frankforter has isolated from the roots of *Isopyrum biternatum* a new base, which differs from the base, *isopyrine*, obtained by Hartsen from *Isopyrum thalictroides*, and which he has, therefore, named

*Isopyroine*. The free alkaloid is crystalline, but loses its crystalline structure at 100° C. and melts at 160° C. Its composition corresponds to the formula $C_{28}H_{46}NO_9$. Its hydrochloride was obtained in the form of long, fine, prismatic needles, melting at 255°–257° C., and forming a double platinum salt melting at 238° C.—Journ. Amer. Chem. Soc., 1903, 99.

*Lupinine—Characters and Chemical Formula.*—Reviewing the work that has been done during the past few years by E. Schmidt and his assistants, to determine the character of the alkaloid of *Lupinus luteus*, and referring particularly to the meritorious work of G. Baumert, Richard Willstätter and Ernest Forneau communicate the results of their investigations, undertaken mainly to show that the chemical composition of lupinine is more simple than that attributed to it by Baumert. By a method given in some detail they obtained perfectly pure lupinine in the form of colorless tables, m. p. 68.5°–69.2°, which remained perfectly colorless and otherwise unchanged during ten months. The product corresponded in nearly all respects with the description of Baumert, with the exception that it was perfectly odorless, whereas Beaumert notes a pleasant fruity odor, reminding of orange, and that it had no effect upon Fehling's Solution, even when heated with it, while Baumert found it to reduce Fehling's Solution completely. The authors prepared the platino-chloride and the benzoyl ester of lupinine and subjected them, as also the pure alkannin, to elementary analysis. The results show that the true formula for lupinine is $C_{10}H_{19}ON$, and not $C_{21}H_{40}O_2N_2$, as given by Baumert.

*Benzoyllupinine*, $C_{10}H_{18}N.O.COC_6H_5$, is readily obtained if equal parts of finely-powdered lupinine and benzoyl chloride are mixed together in a test tube. The mixture rapidly liquefies and strong heat and reaction sets in. If then the mixture is heated for fifteen minutes on a water-bath, the reaction is complete. The excess of benzoyl chloride is removed by evap-

oration (or distillation), the residue rendered alkaline with potassa and the crude product (amounting to one and a half parts) is purified by solution in alcohol and precipitation by addition of water. While easily soluble in the usual organic solvents, benzoyllupinine is practically insoluble in water. It forms fine needle-shaped crystals, melting at 49°–50°, and forms a crystallizable hydrochloride which is readily soluble in water, has a bitter taste and melts, after crystallization from alcohol, at 208°. Physiological experiments, undertaken by Dr. Hans von Baeyer, prove this ester of lupinine to be far more toxic than lupinine itself. While 0.1 Gm. of the latter is necessary to produce a toxic effect upon frogs, when administered subcutaneously, only 0.01 Gm. of benzoyllupinine were required to produce the same heart-depressant effect.—Arch. d. Pharm., *240*, No. 5 (July 25, 1902), 335–344.

*Nervocidine—A New Alkaloid.*—D. Dalma, having successfully employed the leaves of an Indian plant, called "Gasu Baku," in painful palpitis, succeeded in preparing from it an alkaloid, which he has named nervocidine, the hydrochloride of which is stated to have similar properties to cocaine, but to produce more lasting anesthesia. His results have been so good that he suggests that the drug might replace arsenic for dental purposes. B. von Fenyvessy has investigated the properties of the alkaloidal hydrochloride, as prepared by Dalma, which is a yellow, amorphous, hygroscopic powder, readily soluble in water. It produces marked anæsthesia of the cornea in 0.1 or 0.2 per cent. solution, which is very persistent, and a 0.1 per cent. solution brushed on the mucous membrane of the cheek also gives marked anæsthesia. Stronger solutions, exceeding 0.5 per cent. produce irritation of the cornea, and a 2 per cent. solution causes ulcerative keratitis in dogs and rabbits, which lasts ten days, during which period the anæsthesia also lasts. It does not appear to produce anæsthesia by subcutaneous injection. Its general effect is that of a paralysing poison. Although its anæsthetic effect is much more prolonged than that of cocaine, the length of time necessary before this effect supervenes, the irritation caused by the drug, and the toxic symptoms it produces, do not point to the probability of its being of general service, except perhaps in dental practice.—Pharm. Journ., Aug. 23, 1902, 211; from Lancet, 1, 1902, 127.

*Physostigmine—Advisability of Keeping its Salts Diluted with Boric Acid.*—Dr. J. S. Beamensderfer observes that whenever the oculist needs eserine he wants it at once. The disease in which physostigmine is most frequently employed in ophthalmic practice is glaucoma. In such cases it is not only essentially necessary for the physician to diagnose his case immediately, but also that he can at once apply the remedy. The author thinks that trituration with boric acid will not only keep the physostigmine in good form, but ready for solution, and thus available when most in need.—Proc. Pa. Pharm. Assoc., 1902, 145.

*Yohimbine—Review of the Literature Pertaining to It.*—In a paper read before the meeting of German Naturalists and Physicians, at Carlsbad, Sept., 1902, Dr. P. Siedler gave a resumé of the work that has been done on, and the literature of the alkaloid "yohimbine," obtained from a species of *Tabernæ* (*T. montana*), which is used medicinally in aphrodesiac mixtures.—Amer. Journ. Pharm., Dec., 1902, 600.

*Yohimbine—Differences in Composition.*—Siedler points out that yohimbine, one of four alkaloids, and the most important one, of "yohimba bark," exhibits certain differences in composition in different specimens which requires further investigation.—Pharm. Post, *35* (1902), 570.

*Antipyrine—Saline Compounds.*—A. Reychler finds that when an aqueous solution of antipyrine is treated with a slight excess of hydrochloric acid and evaporated a syrupy residue is obtained showing hardly any signs of crystallization, but a better result was obtained when 30 Gm. of antipyrine, 50 Cc. of alcohol and 20 Cc. of strong hydrochloric acid were concentrated on the water-bath; the residue was treated with a further quantity of alcohol and acid and re-evaporated; the mass formed was eventually freed from moisture by washing it with alcohol and ether, and finally with pure ether; the body formed is

*Antipyrine Hydrochloride*, $C_{11}H_{12}ON_2.HCl$; it is barely soluble in benzene, but fairly so in a boiling mixture of 5 parts of benzene to 1 part of absolute alcohol. On cooling, an abundant crop of prismatic crystals is obtained, containing benzene of crystallization. The author has also prepared

*Antipyrine Camphorsulphonate*, which is very soluble in water, though not deliquescent. It can be recrystallized with ease from a mixture of 1 part of absolute alcohol and 4 parts of acetone in the form of hard, compact prisms fusible at 166°.—Chem. News, Feb. 6, 1903, 71; from Boll. Soc. Chim. (3), *27*, No. 12.

*Butylchloral Antipyrine—Preparation and Properties.*—According to "Boll. Chim. Farm.," butylchloral antipyrine, which has the formula $C_{15}H_{17}ON_2Cl_3$, occurs in yellowish crystals, melting at 70°–71° C., and is sublimable. Butylchloral hydrate, 10 Gm., is rubbed down in a mortar with antipyrine, 9.7 Gm., so as to form a pasty mass. To this an equal quantity of water is added and a few drops of strong HCl, and the solution warmed. On cooling, butylchloral antipyrine separates out. By dissolving equivalent weights of antipyrine and chloral hydrate in warm water, and subsequently crystallizing, the same body is obtained in white crystals, melting at 68° to 69° C. Butylchloral antipyrine is soluble in alcohol, ether and chloroform, and in water at 25° C. to the extent of 1 :15. It gives a red color to iron salts. Pharm. Centralh., *44*, 93.

*Diphenylamines—Easy Method of Preparation.*—The usual method for the formation of diphenylamines requires heating in closed vessels at high

temperatures, and the return is limited. R. Vidal, however, finds that it is easy to effect the formation of dioxyphenylamine by heating *p*-amidophenol with its hydrochloride, or that of amidoxydiphenylamine by heating the hydrochloride of *p*-amidophenol with *p*-phenylenediamine. The reactions are best carried out in closed vessels in an oil-bath, at a temperature of about 200° for four hours. The reaction is particularly sharp in the presence of a certain amount of water, about three or four times the weight of the compounds used in the operation; these should be in molecular proportion. The returns are nearly theoretical.—Pharm. Journ., Jan. 10, 1903, 29; from Mon. Scient., 4, xvi.

*Phenacetin—A New Test.*—F. H. Alcock and W. Wilkins call attention to a new reaction with phenacetin, which distinguishes it from all other official (B. P.) synthetic remedies and is attended with less uncertainty. They find that if 0.01 Gm. of phenacetin be strongly heated for a few minutes with 5 Cc. of pure sulphuric acid in a porcelain dish, a distinctive color reaction is obtained, which may be called a variety of purple. On pouring the resulting liquid, when nearly cold, into much distilled water and filtering the solution, then adding ammonia water in excess, a very deep, purple-colored solution results, which, in order to be well seen, should be largely diluted with water.—Pharm. Journ, Sept. 6, 1902, 258.

*Phenolphthalein — Value as Purgative.* — Phenolphthalein, introduced into medicine as a purgative under the name of "purgen" (in Proceedings 1902, 801) has been investigated in this direction by Dr. F. W. Tunnicliffe, who finds it to be a valuable and safe aperient, and thus summarizes his observations:—For children, phenol-phthalein, in doses of from ¾ to 2½ grains, is a useful aperient. For adults, in ordinary cases, it must be given in does of 1½ to 4½ grains. In obstinate constipation this dose must be increased up to 15 grains. Phenol-phthalein produces purgation in jaundice; it has no irritant action on the kidneys, and its depressant action is less than that of magnesium sulphate. It does not appear to lose its effect after repeated administration. It is generally administered at night, in the form of tablets.—Pharm. Journ., Nov. 29, 1903, 563; from Brit. Med. Journ., Feb. 1902, 1224.

*Pyridine Tannate—Preparation and Therapeutic Value.*—Braeutigam prepares pyridine tannate by pouring a solution of pyridine into an excess of solution of tannic acid, observing that the temperature of the solutions does not exceed 10° C. The resulting precipitate is washed with cold water until the washings give no perceptible reaction with pyridine solution, is then dried at 20° to 25° C. and preserved in the dark. The author finds this compound to be a valuable uric acid solvent, and believes that it may also find application as an intestinal astringent.—Pharm. Ztg., *47* (1902), 498.

*Iodol—Determination of Iodine.*—The following method for determin-

ing the amount of iodine in iodol is recommended by B. Sjollema: A weight of iodol is dissolved in 2.5 NaOH solution and reduced by boiling with zinc dust (about 4 Gm. for each 0.5 Gm. of iodol taken), the heating being continued until all the pyrrol is driven off, the vessel being covered with a funnel to prevent spurting. The turbid liquid is then decanted from the excess of zinc dust, the latter washed, and the washings added to the first decantation. An excess of ammonium nitrate is then added, and a few Cc. of ammonia followed by enough $AgNO_3$ solution to combine with 95 per cent. of the iodine (0.5 Gm. iodol = 0.4448 Gm. iodine). The precipitate is filtered off, and the filtrate treated with silver ammonio nitrate. If more than 95 per cent. of the theoretical amount of iodine be present a precipitate will be formed, but if less, none.—Pharm. Centralh., 1902, 614; from Ned. Tijdschr. von Pharm., 1902.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

*Aloins—Characters and Constitution.*—E. Leger, has heretofore shown that barbaloin and iso-barbaloin yield the same oxidation products when treated with $Na_2O_2$, viz., methylisoxychrysasin, and that the chloro-derivatives of these same aloins yield a single tetrachlor-methylisoxychrysasin, thus showing the isomeric aloins to contain a common group. Both form chrysammic acid on treatment with $HNO_3$; both give the furfural reaction. Another product of the decomposition of the aloins by $Na_2O_2$ has been isolated in the form of a colorless syrup, and which appears to be an aldo-pentose. From this it is inferred that

*Barbaloin* may be regarded as a condensation product, with loss of water, of methylisoxychrysasin and an aldo-pentose (methyl-aldopentose). Barbaloin and iso-barbaloin appear to be isomeric with frangulin; but, whilst the latter, a true glucoside, is decomposed by dilute acid, the aloins are not. They behave as ether oxides. Apparently the pentosic group in the Natal aloins is less strongly attached to the anthraquinone group than in the other aloins. On the other hand the anthraquinone grouping in nataloin and its homologue appears to exist in a latent state and only to be revealed under the influence of $Na_2O_2$. These aloins, when treated with $HNO_3$, yield principally oxalic acid with a small quantity of picric, whilst barbaloin yields a nitro-derivative of an oxyanthraquinone. The author tentatively proposes for

*Nataloin* the formula $C_{23}H_{26}O_{10}$—that being most in accord with observed facts. Is less soluble in methyl alcohol than barbaloin and is almost insoluble in water or ether, but dissolves readily in acetic ether. It behaves as a phenol, dissolving in solutions of the caustic alkalies. When warmed with dilute sulphuric acid, vapors are evolved which redden aniline acetate paper (furfural reaction). In acetic ether solution it is lævo-rotatory. Nataloin reacts with benzoyl chloride, forming tetra- and hexabenzoyl derivatives. By the action of sodium dioxide the methyl

ester of a new emodin, which the author proposes to call nataloemodin, is formed. This compound has the formula $C_{10}H_{12}O_5$. Homonataloin, $C_{22}H_{24}O_{10}$, is found in the first fractions of a mixture of the aloins. It presents all the characters of nataloin and gives the same color reactions with $H_2SO_4$ and $HNO_3$. Its solution in acetic ether has a slightly higher rotation than nataloin. It yields the furfural reaction. On treatment with sodium dioxide the same methylnatalo-emodin is obtained as in the case of nataloin. By the action of benzoyl chloride tetra- and hexa-benzoyl-homonataloins are obtained.—Pharm. Journ., March 14, 1903, 286; from Journ. Pharm. Chim., Jan., 1903, 13 and 52.

*Antiarin—Properties.*—Seligman has studied the characters of the active glucosidal constituent, antiarin, of the sap of *Antiaris toxicaria*, the "Upas Tree," which is employed by the natives of the Baram district, Sarawak, for poisoning their darts. It probably has the formula $C_{21}H_{30}O_8$, forms microscopic, needle-shaped crystals, or sometimes flat plates, with a melting-point of 208°–215° C., and is soluble in alcohol. It acts on the ventricle of the heart as a poison of the digitalin group, causes paralysis of the central nervous system, and produces transient clonic spasms of the voluntary muscles.—Pharm. Journ., March 14, 1903, 385; from Journ. of Physiology, xxix, 1903, 39.

*Cantharidin—Determination.*—E. Léger recommends the following process for the determination of cantharidin: Twenty-five Gm. of the powdered Spanish flies are macerated for three hours in a closed flask, at a temperature of 60°–65° C. with a mixture of benzene, 125 Cc., and hydrochloric acid, 2 Cc., the whole being occasionally well agitated. The flask is then cooled, and the contents transferred to a tubular percolator, the lower extremity of which is closed with a plug of wool, previously moistened with benzene. When percolation ceases, this liquid is set aside, and extraction continued with fresh benzene, the second percolate being collected apart. When the powder is exhausted, the two percolates are distilled separately in a tared flask on the water-bath, the weaker or second percolate being treated first, then the first or stronger liquid, the last traces of benzene being driven off by plunging the flask up to its neck in the water of the bath, and blowing air into it. It is then cooled, and the green oily residue, in the midst of which crystals of cantharidin will be seen floating, is taken up with 10 Cc. of petroleum ether, distilling below 50° C. The flask is then corked and set aside for twelve hours. The liquid is then carefully decanted through a small tared filter previously moistened with benzene, taking care not to transfer any of the crystals thereto. The crystals left in the flask are washed with 24 Cc. of petroleum ether, in four quantities each of 6 Cc., which are in succession run through the filter; the latter is then thoroughly washed with petroleum ether. The flask and filter, after a few minutes' exposure to the air, are now dried for one hour at a temperature of 60°–65°, the flask being in-

clined, to permit the circulation of vapor in its interior. At the expiration of that time the cantharidin is weighed. Care should be taken that the prescribed temperature and time for drying are observed. The author has found by experiment that cantharidin is slightly but appreciably volatile at 60°–65°, so that it cannot be dried to constant weight. By this method cantharides should yield not less than 0.4 per cent. cantharidin. —Pharm. Journ., June 6, 1903, 783; from Journ. Pharm. Chim. [6], *17*, 457.

*Cantharidin—New Method of Assay.*—Puran Sing, after reviewing the published processes for the isolation of cantharidin or the assay of the beetles, recommended that of Nagai as satisfactory, but prefers the following method of his own :—Twenty-five Gm. of the beetle and 200 Cc. of a 5 per cent. by volume solution of nitric acid are mixed and evaporated with a little plaster of Paris in the water-bath. The dry mass is powdered and extracted with chloroform. On evaporating the solvent, the cantharidin which crystallizes out is accompanied by a yellow, oily liquid which, however, is readily removed by washing with a little alcohol or ether. The nitric acid used oxidizes the fat of the beetle, renders it more easily soluble, and therefore more readily removed from the associated cantharidin.—Pharm. Journ., April 18, 1903, 558; from Journ. Pharm. Jap., through Journ. Pharm. Chim. (7), *17*, 73.

*Anthraquinone Derivatives—A Class of Synthetic Purgatives.*—At a recent meeting of the British Medical Association, Prof. Tunnicliffe communicated to the Pharmacological Section a paper in which he pointed out that recent researches into the chemistry of the vegetable purgatives, especially of the rhubarb group, appear to show that the active purgative principle of those substances is an anthraquinone derivative. Starting from this fact, certain artificial anthraquinone derivatives have been made in the laboratory and one—

*Anthrapurpurine Acetate*—has been introduced into therapeutics as a purgative, under the name of "purgatin" or "purgatol." Its properties have recently been investigated by Prof. C. R. Marshal, who describes it as a yellowish-brown, micro-crystalline powder (m. p. about 175° C.). It is practically insoluble in cold water or dilute acids; slightly soluble in hot water, alcohol, ether or chloroform; more readily soluble in glacial acetic acid or xylene, from either of which it may be crystallized. It is also soluble in alkaline liquids, with which it forms reddish-violet solutions. The compound is tasteless and odorless, mild in action and may be taken in tablets or suspended in water, in doses of 0.5 to 1 Gm. It is absorbed, however, to some extent, since the urine becomes red after administration of the compound. According to Professor Tunnicliffe, the phthaleins also exert a purgative action, and have certain advantages over both the natural purgatives and the artificially-prepared anthraquinone derivative, which, as already stated, is absorbed to some extent. The substance of especial

interest in this connection is the chemical indicator phenolphthalein, which is being introduced under the name "purgen." It is claimed that purgen acts by causing a slight irritation of the intestinal canal, and is subsequently entirely excreted in the ordinary course, none of it being absorbed, unless it is administered in very large doses.—Pharm. Journ., Sept. 13, 1902, 275.

*Rhein—Production from Emodin.*—In the course of further experiments on the chemistry of emodin and chrysophanic acid, which are, respectively, *di-* and *tri-oxymethyl-anthraquinone*, Œsterle has obtained from emodin a crystalline principle analogous to *rhein*, or *tetra-oxymethyl-anthraquinone*. —Schw. Wochens. f. Ch. u. Pharm, 1902, 600.

*Salicin and Salinigrin—Variation in their Occurrence in Different Willow and Poplar Barks.*—One of the most interesting papers read at the Dundee meeting of the British Pharmaceutical Conference was that by H. A. D. Jowett and C. E. Potter on variations in the occurrence of salicin and *salinigrin* in different willow and poplar barks. In 1900, one of the authors had shown in a paper read before the Chemical Society that the glucoside obtained from an unknown species of *Salix* was not salicin, but a new substance, which he named

*Salinigrin*, because the bark from which it was obtained had been supplied as "black willow." It differed from salicin by yielding on hydrolysis, besides glucose, meta-hydroxy-benzaldehyde, instead of ortho-hydroxy-benzyl alcohol. This has since led to the examination of twelve American willows and poplars and nineteen European species. Salinigrin was found in only one (*Salix discolor*, Muhl., from Ithaca, N. Y.), and a separable amount of salicin from one also, although nine gave evidence of the existence of glucoside by an indirect method (hydrolysis and sugar estimation), five of these undoubtedly being salicin or populin. These meagre results led the authors to examine barks collected at different seasons (time of year being known to have an effect on the salicin-content). The results were remarkable, *Salix purpurea* bark from Cambridge giving only traces of salicin in July, 2.2 per cent. in October and January, and 3.5 per cent. in April. Then they turned their attention to the sex of the trees, in order to see if that has anything to do with the salicin-content, and here equally astonishing results were obtained. Thus *S. purpurea* bark from a male tree gave 1.2 per cent. salicin in April and 3.9 per cent. in July; and a female tree 3.5 and 0.2 per cent. in these months. The explanation of all this is that salicin is stored up in the tree to be used as food in the spring; the male trees use this up first in carrying out their functions up to production of pollen, and the female trees use up their salicin rapidly as soon as the stigmas receive the pollen. The results of this investigation are briefly summarized by the authors as follows:

(1) That of the thirty-three samples of willow and poplar examined,

salinigrin was only found in one, *Salix discolor*, Muhl, which may therefore be considered to be the source of salinigrin.

(2) That the amount of salicin contained in the bark of a willow or poplar depends not only on the species, but on the season of the year at which it is collected, the sex of the tree, and possibly other factors.

The investigation has shown, therefore, that for practical purposes chemical assay alone can decide whether a willow bark does or does not contain salicin.—Trans. Brit. Pharm. Conf. 1902, 483–490.

*Salicin—Location and Yield from Willow Bark at Different Seasons.*—David Brown has examined the bark of a male willow tree, *Salix purpurea*, collected about the end of 1901, and made with this and bark collected from the same tree in the spring of 1893 and the autumn of 1894 a series of experiments, with the following results: *A*, being characterized as very thin, deep yellow, and very bitter; *B*, much thicker than *A*, almost white, and also very bitter; and *C*, very much thicker than *A* or *B*, dirty grey in color, and distinctly bitter, there being respectively the inner, middle and outer layers of the 1901 bark in air-dry condition.

The whole bark contained 5.8 per cent. salicin.

*A*. The inner bark contained 11.3 per cent. salicin.

*B*. The middle bark contained 8.0 per cent. salicin.

*C*. The outer bark contained 2.5 per cent. salicin.

It appears, therefore, that while salicin exists in all parts of the bark, it is found in largest quantity in the inner, next in the middle, and only in comparatively small quantity in the outer bark.

Samples of bark taken from the same tree in the spring of 1893, and also in the autumn of 1894, were found to contain the following quantities of salicin:

Spring, 1893, = 7.38 per cent.

Autumn, 1894, = 6.66 per cent.

This points to the presence of a larger percentage in spring, when the tree is bursting into vigorous growth, than in the autumn, when it has finished its year's work.—Pharm. Journ., April 25, 1903, 588.

*Salicin—Source and Preparation.*—T. Fawssett states that the best material for preparing salicin is undoubtedly the willow peelings, obtained as refuse from a basket manufactory, and known in Belgium as "rood schors" but the botanical origin of the material is uncertain. Mr. David Brown says that the peelings are produced from *Salix fragilis*, while Dr. Crispo considers the source to be *Salix purpurea*. The working up of these peelings should be soon after they are stripped from the twigs, and the method of preparing salicin might perhaps be best if conducted as follows: Macerate "rood schors," willow peelings in water for some hours at a temperature as much below the boiling-point as will exhaust them. Strain and remove all moisture from the marc by hydraulic pressure. Evaporate the fluid extract thus formed to a low bulk (*in vacuo*.) Throw out the

tannin and extractive by treating the liquid successively with quick lime, lead acetate and lead subacetate, in the order named. Remove excess of any of these precipitants with oxalic acid. Filter and evaporate the clear solution to crystals. In the author's experience, this treatment generally sufficed to obtain a satisfactory product, but sometimes a final purification with animal charcoal was necessary. Pharm. Journ., June 6, 1903, 784.

*Chromo-Santonin—Composition and Properties.*——According to C. Montanari the yellow body formed by the action of light on santonin, chromo-santonin has the same composition—$C_{15}H_{18}O_2$—and the same molecular weight as santonin. The derivative, however, shows some difference in the solubility and optical rotation. It is more easily oxidized than santonin, from which it probably differs in the position of the double linkages uniting the carbon alone with the hydronaphthol nucleus. Chromo-santonin is reconverted into santonin by repeated recrystallization.—Pharm. Journ., March 14, 1903, 386; from Berichte, *33*, 2346.

*Vanillin—Theory of Formation.*—Lecomte, discussing the formation of vanillin, holds that two ferments are concerned in this process, one having hydrolyzing properties, the other oxidizing properties. According to the proposed theory, the hydrolizing ferment decomposes the coniferin present in the fruits into coniferylic alcohol and glucose, the coniferylic alcohol being then oxidized into vanillin by the second ferment.—Amer. Journ. Pharm., June, 1903, 288; from Journ. de Pharm. et de Chim., 1903, 343.

### COLORING MATTERS.

*Indigo and Indigotine—Comparison of Advantages.*—In a report on the trade of Marseilles, Consul-General Gurney refers to the subject of German and French competition with India in the matter of indigo. He states that the future of natural indigo hangs on the question whether the old-time methods of Indian indigo-planters cannot be sufficiently improved to enable natural indigo to be produced at a profit in India at a much lower cost than is the case at present, and he is of opinion, from the experiments already made, that it is quite possible. The points in favor of the artificial product are said to be: (1) That it is preferred by small dyers on account of its easy and advantageous employment when small quantities are dealt with. (2) Because it is easy to purchase in small quantities, and does not, like natural indigo, require to be stored and carefully watched. (3) Because it is easy to keep, easy to prepare for use, is economical, every bit of the dye in the vat being utilizable; and (4) because of its great purity and vivid coloring, equal shades being obtainable with almost mathematical precision. On the other hand, it does not contain the resinous substance found in the natural indigo which gives solidity to the cloth; consequently, it is still in demand for the dyeing in wholesale quantities of cloths that are expected to stand much exposure to sun and rain. The French government, Mr. Gurney states, still insists

on the use of the natural dye for uniforms, while the German government has given way, in view of the immense German interests involved in the industry of artificial chemical colors. The cultivation of Indian indigo, Mr. Gurney thinks, can be improved on scientific principles.—Pharm. Journ., Nov. 29, 1902, 595.

*Indigo—New Synthesis.*—T. Sandmeyer describes a new synthesis of indigo. Starting with thiocarbanilid, $CS(NH.C_6H_5)_2$, this is converted by the simultaneous action of white lead and potassium cyanide into the hydrocyanide of carbodiphenylimide, $C_6H_5.N:C(CN).NH.C_6H_5$. By the action of yellow ammonium sulphide this compound is changed into thioamide, $C_6H_5.N:C(CS.NH_2).NH.C_6H_5$, which, when stirred into warm sulphuric acid, undergoes condensation, and yields an *a*-isatinanilid. The acid solution so obtained is now allowed to flow into ice water simultaneously with a solution of sodium sulphide, whereupon the anilid is converted into thioisatin, which is thrown down as a bulky precipitate. In order to prepare the indigo it is now only necessary to make the precipitate into a thin paste and mix it with a little alkali, when the thioisatin rapidly decomposes into indigo and sulphur. The sulphur is removed by extracting with carbon disulphide, and the indigo is left in the form of light, dark-blue blocks, which readily crumble when rubbed between the fingers, and can be made into a uniform paste which is easily reduced to indigo white.—Pharm. Journ., June 6, 1903, 784; from Zeits. f. Farb. u. Textil. Chem., through Nature, *68*, 93.

*Isatin—Practical Observation on Its Preparation.*—While recently preparing isatin from indigo by oxidation with nitric acid, H. J. P. Firmin made the following interesting and practical observation on the separation of the resin: Most of the resin is precipitated from a strong ammoniacal solution of the resinous and crystalline mass by the cautious addition of diluted hydrochloric acid; the solution filtered and more acid added till the precipitate shows signs of isatin. At this point a minute quantity of ammonia is added—with diligent stirring—just sufficient to remove the tendency to a reddish tinge in the precipitate, and the liquid set aside for several days. The resin will precipitate completely without any loss of isatin, and on filtering and adding more acid a most brilliant red precipitate of the latter will occur quite free from resin. It is naturally impossible on paper to describe the exact point at which to add or stop adding the acid or ammonia, but in practice it is soon hit upon. If a little too much ammonia is added, a trace of acid will put matters right, and *vice versa*.—Chem. News, Dec. 12, 1902, 283.

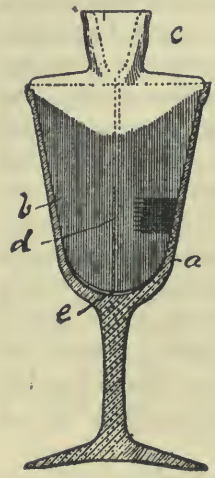
## ALBUMINOIDS.

### (INCLUDING ANIMAL PRODUCTS.)

*Albumen—Apparatus for Facilitating its Clinical Determination.*—

Ralph C. Robinson has invented the apparatus illustrated by Fig. 62, by means of which the zone of reaction is readily recognized when applying the nitric acid test for albumen to urine. The apparatus consists of a flat "blade" *b*, made of glass, and conforming to the shape of a glass wine container, *a*. The upper part of the "blade" is prolonged, and forms a funnel, *c*, from the lower point of which a perforation, *d*, extends through the "blade" down to the bottom of the glass, *a*, and ending at *e*. One side of the "blade" is blackened, while the other side may be made white, by which means the readings are greatly facilitated, says the inventor. In use urine is introduced in the glass, *a*, and nitric acid then poured into the funnel, *c*. The acid displaces the urine very gradually, and affords a very sharply defined zone, which allows the reaction to be quite easily observed, the inventor states.—Merck's Rep., Oct., 1902, 396.

FIG. 62.




Albumen Apparatus.

*"Certified Milk"—How Secured.*—The term "certified milk" is applied to the product of a New Jersey dairyman who, since 1893, has most stringently adhered to the standards required by an Essex County Medical Commission. This milk shows the lack of micro-organisms in large numbers and the entire absence of pathogenic varieties; an unvarying resistance to early fermentative changes, so that it may be kept under ordinary conditions without extraordinary care; and a constant nutritive value of known chemical composition, with a uniform relation between the percentages of fats, proteids and carbohydrates. A chemist, bacteriologist, physician and three veterinarians are employed by the commission to regulate matters of hygiene, sanitation, etc. The buildings on the farm are well constructed, drained and ventilated; the fodder, which is of exceptional quality, is kept apart from all contamination; there is a good water supply; and everything is kept scrupulously clean continually. There are no stagnant pools in the neighborhood; no fowls, hogs, horses or other live stock on the farm; no sick or excited cows; and no animal bred through consanguinity within a period of three generations. No animal odors are noticeable in the stables; the cows are thoroughly milked in a clean building, after their udders have been cleaned, and the milker, having put on clean overalls, has washed his hands. The milk is at once transferred to sterilized, dry cooling cans, through a No. 100 sieve, is cooled in a separate building to between 40° and 50° F., transferred to clean sterilized glass jars, hermetically sealed, and reaches the consumer within 24 hours.—Am. Journ. Pharm., Sept., 1902, 452.

*Milk Constituents—Digestibility.*—F. W. Tunnicliffe has experimented

to determine the digestibility of the casein of various milks. The preliminary curdling, due to the acid and rennet, which occurs in digestion influences the result by the fineness of the precipitate. The precipitate of cow's milk thus produced is much coarser than that of human milk. An attempt was made to imitate natural digestion by first digesting a measured amount of milk with acid and pepsin for one hour, then filtering and digesting with pancreatin in an alkaline solution for three hours. By this method human milk was found to be far more digestible than cow's milk, or patent milk-foods, some of the latter being found to be even less digestible than cow's milk. The percentage of the whole found to be digested by this treatment was, of human milk, 75.46 per cent.; of cow's milk, 47.44 per cent., and of one of the dearest of the patent milks (labelled "human milk") only 36 per cent.—Pharm. Journ., Feb. 28, 1903, 266; from Journ. of Hygiene, II, *4*, 1902.

*Ewe's Milk—Composition.*—Basing their figures on the examination of 171 samples, Trillat and Forestier give the following as being the average percentage composition of ewe's milk: Total solids, 18.56 to 20.03; fat, 6.9 to 7.4; lactose, 5.37 to 5.53; casein, 5.54 to 6.18; ash, 0.934 to 1.021; lime, 0.247 to 0.256; free acid, 2.8 to 3.7 per cent. Ewe's milk is thus shown to be richer in total solids than that of cows. The authors' figures are markedly higher than those given by other investigators.—Pharm. Journ., Oct. 11, 1902, 367; from Compt. rend., *134*, 1517.

*Milk—Arnold's Guaiac Test for the Distinction of Fresh from the Boiled.*—Weber's researches lead him to the conclusion that Arnold's test for distinguishing between fresh and boiled milk is very suitable, while one reagent—guaiacum tincture—is easy to obtain and keeps well. The test is not available in presence of formaldehyde, but answers both with sweet and sour milk and with whey. Samples of guaiacum tincture which are not transparent are not to be used, while it is advisable to test the reagent from time to time upon a sample of unboiled milk.—Milch. Ztg., 1902, 657, through Chem. Zeit. Rep., 1902, 327.

Another method of distinguishing boiled from unboiled milk is described by F. Schardinger. Fresh milk, 20 Cc., with 1 Cc. *methylene-blue-formalin solution* warmed to 40-45° C., discharges the color, while fresh milk with methylene blue alone remains colored. With boiled milk the color is discharged in neither case. The required reagents are prepared by mixing 5 Cc. saturated alcoholic methylene blue, 5 Cc. formalin and 190 Cc. water, and for the simple solution 5 Cc. sat. alc. sol. of the blue with 195 Cc. water. Sour milk always discharges the color of the methylene blue formalin solution, but only occasionally the color of the simple blue solution.—Ztschr. Unters. Nahr. u. Genussm., 1902, 1113.

*Milk—Apparatus for its Gravimetric Analysis.*—G. B. Macdougald has given an interesting description, accompanied by an illustration, of a

rather complicated apparatus, designed by him for conveniently carrying out the analysis of milk by the gravimetric processes of Adams and of Werner-Smith. This paper cannot be advantageously condensed and must therefore be consulted in the original, in Trans. Brit. Conf., 1902, 466–472.

*Milk—Fallacy of Acidity Test With Litmus.*—H. D. Richmond states that it is quite fallacious to endeavor to test the acidity of milk with litmus-paper, since it is possible to condemn all fresh milk as the result of applying that test. Litmus-paper may be either red, containing only the acid, or blue, containing the acid with such an amount of alkali that no red ions are formed, or at some intermediate stage. If those papers be used to test a partially-neutralized mixture of acids of various strength, contradictory results may be obtained. Phosphoric acid is a good example of three different acidities in one molecule; the first acidity is strong, the third is very weak and the second is intermediate between the two, and about equal in strength to the acid of litmus. It has been shown that milk contains phosphates with the third acidity completely neutralized and the second only partly so, and, therefore, milk is an excellent substance to show the peculiar behavior of litmus. If blue litmus-paper be dipped into milk, the blue litmus, having the acid completely neutralized, is more alkaline than the milk, and the two tend to come into a condition of equilibrium by a portion of the alkali of the litmus passing to the milk; the consequence is that the litmus becomes less alkaline and turns slightly red. If red litmus-paper, which is more acid than the milk, be used, alkali will tend to pass from the milk to the litmus and turn it slightly blue. This is the so-called amphoteric reaction. A litmus-paper of some intermediate stage would be unaffected.—Chem. News, Oct. 17, 1902, 192.

*Milk—Detection of Formaldehyde.*—A convenient and sensitive test for the presence of formaldehyde in milk consists, according to Mangel and Marion in sprinkling a minute quantity of amidol or diamidophenol on the surface of the milk. Pure milk will assume, after a few moments, a salmon pink, while in the presence of formaldehyde a bright yellow color is developed. This reaction is said to be very sensitive, as little as 1 part of formaldehyde in 50,000 parts of milk still giving the reaction very distinctly. Amer. Journ. Pharm., March 1903, 139; from Journ. de Pharm. et de Chim., 1902, 532.

*Milk—Improved Test for Boric Acid.*—According to C. E. Cassal and Henry Gerranz the turmeric test for boric acid in milk may be improved by the addition of oxalic acid. The milk (or other food) is first dried, then incinerated to ash, adding a little caustic baryta before evaporation and incineration, else some of the boric acid might be lost. The ash is treated with a few drops of hydrochloric acid, then with saturated solution of oxalic acid, and finally with alcoholic solution of turmeric. The mix-

ture is dried on the water-bath, and the residue taken up with a little alcohol, which becomes colored more or less intense magenta red if boric acid is present. The test may also be used quantitatively.—Chem. News, Jan. 16, 1903, 27; from Brit. Food Journ., Oct. 1902.

*Milk.*—Detection of *Formaldehyde* by means of amidol. See "Formaldehyde."

*Proteolytic Enzymes and Tryptophane—Distribution in Plants.*—Vines records a number of new facts relating to the distribution of proteolytic enzymes and of tryptophane in plants. He proved that the juices or tissues of the most widely different plants so act on certain proteids, whether contained in them or added to them, as to give rise to a substance giving a reaction similar to that of tryptophane with chlorine water. Tryptophane itself has not indeed been definitely isolated, but strong presumptive evidence is adduced, which justifies the assumption that the substance in question is actually tryptophane. Vines has demonstrated the presence of a proteolytic enzyme in a number of different natural orders of the Phanerogams, and also in the Fungi and Pteridophyta. He is confident that it will also be discovered in the Byrophyta and the Algæ. Though in some cases, such as the melon and the mushroom, the enzyme may be regarded as a vegetable trypsin, this view cannot be extended to others. In foliage-leaves, stems, and roots, the enzyme seems to correspond with "erepsin," an enzyme formed in the mucous membrane of the small intestine, which actively proteolyses peptone and casein, but does not act upon the higher proteids. The protease generally associated with depositories of proteid nutriment such as seeds, fruits, and bulbs, seems to be a trypsin. Vines's observations have been taken during the period between August and November only; investigation of leaves at different times of the year would probably yield much additional information. The most interesting point which has been brought out is that the proteases are now brought into line with the enzymes concerned with the carbohydrate metabolism of the plant. The proteolytic enzyme, like diastase, is everywhere present, and just as diastase facilitates the transference of temporarily deposited starch, so the proteolytic enzyme renders possible the distribution of the elaborated proteids. The peculiarity of "insectiverous" plants is now limited to this—that their enzyme is poured out at the surface, so that it digests proteids supplied from without by the captured insects, whereas in ordinary plants the enzyme is retained within the tissue to digest the proteids that are there formed.—Pharm. Journ., May 23, 1903, 699; from Annals of Botany, *17*, 65.

*Pure Pepsin—Attempt to Obtain a Product of Constant Composition.*—C. A. Pekelhaving has endeavored to solve the problem of obtaining a pepsin of such a constant composition that it may be regarded as a chemically pure substance. He did not succeed in this, for although the per-

centages of nitrogen and hydrogen in his various preparations appeared fairly constant, the carbon, and particularly the phosphorus, varied.—Apoth. Ztg., 1902, 795; from Ztschr. Physiol. Chem., 1902.

*Scale Pepsin—Manipulation.*—Dr. Cuvier R. Marshall gives a description, accompanied by several graphic illustrations, of the process of preparing scale pepsin in a large manipulating concern. Previous to the scaling itself, a solution is gotten by treating the peptic membranes of the hog in large, glazed earthenware vessels with weak hydrochloric acid, at a temperature of about 40° C. This is then clarified by means of a mechanical filter. Satisfactory results depend in large measure upon the care with which the filtration of the solution is performed. Every particle of objectionable material must be removed, for unless that be done it would be impossible to produce pepsin of fine quality, of ready solubility, free from odor and possessing active proteolytic power. The clarified solution is then spread upon sheets of glass, as follows: With his left hand the operator holds a plate of glass in an inclined position over a tray containing the pepsin solution, the plate resting upon two supports placed within the tray. With his right hand he fills a long, semi-cylindrical dipper from the tray, and holding it across the face of the glass plate, parallel with the upper edge, gently tilts it in such a way as to cause a broad stream of the fluid to fall upon the glass, and flow evenly downward into the tray. A thin film of solution adheres to the surface of the plate, which is immediately placed in a dust-proof compartment to dry. These compartments are supplied with a current of fresh air at any desired temperature. This passes backward and forward over the plates, and is discharged through flues that penetrate the roof of the building. The air is heated by steam coils and is kept in motion by a huge rotary fan revolving at a high rate of speed. It is desirable that the temperature of the air be as nearly invariable as possible, and this is easily managed by reducing or increasing the number of heating coils in service. Thermometers in the compartments enable the attendants to note any variation from the proper degree of heat. When the pepsin film has become thoroughly dry, the glass plates are taken, one by one, from the drying closets and placed, film-side uppermost within a partly enclosed tray. Then with a broad steel instrument the coating is scraped off into the tray and collected as bright shining flakes of "scale pepsin." If then it yields a satisfactory result when subjected to the U. S. P. test, the product is ready for the market.—Bull. Pharm., April, 1903, 160–161.

*Maizin—A New Albuminoid from Indian Corn.*—E. Donard and H. Labbé find that Indian corn contains a peculiar albuminoid, to the extent of 4 to 4.5 per cent. To this they attribute the formula $C_{184}H_{300}N_{46}O_{54}S$. Maize flour is first deprived of its oil by treatment with pure benzene, then extracted with hot, anhydrous amylic alcohol, in which the albuminoid is soluble. The amylic solution is then mixed with pure benzene, which pre-

cipitates the maizin in the form of flocks. It is collected, washed with benzene and dried *in vacuo*. It forms a white, very fine, light powder, insoluble in water, either hot or cold; it is partially hydrolyzed by prolonged boiling with water. It is soluble in ethyl and methyl alcohols, and in acetone—more readily in the warm solvents than in cold. It is precipitated from these solutions by ether. It is not dissolved by saline solutions nor by dilute acids, but when boiled with the latter develops a peculiar odor. It is, however, readily soluble in dilute alkalies, even when the amount of alkali present does not exceed 0.05 per cent. Amyl alcohol, when cold, only dissolves traces of maizin, but when hot it takes up 11 to 11.5 : 100. It is similarly dissolved by the higher alcohols by the aid of heat.—Pharm. Journ., April 11, 1903, 525; from Comptes rend., *135*, 744.

*Erepsin—Occurence in Various Species of Fungi*—According to the investigations of C. Delezenne and H. Mouton the *Basidomycetes* contain a digestive ferment similar to erepsin isolated by Cohnheim from the mammalian intestinal mucous membrane, and having the same power of disintegrating peptones and albumoses. Among the fungi experimented with *Amanita muscaria*, *A. citrina*, *Psalliota campestris*, *Hypholoma fasciculare*, and others showed the presence of a very active form of erepsin. Incidentally, *Psalliota campestris* was found to contain but little kinase although it was very rich in the erepsin ferment. This would appear to throw doubt upon the statement of Hamburger and Heckma that that erepsin and kinase are identical.—Pharm. Journ., May 2, 1903, 613; from Comptes rend., *136*, 633.

*Reductase—A new Reducing Diastase.*—E. Pozziescot mentions that the diastase known by the name of "Koji" or "Taka" and secreted by "*Eurotium Orizæ*," is met with commercially in two forms; the first, in tabloids, consists entirely of "Koji" or Japanese yeast; the second, in the form of an amorphous, yellow powder soluble in water, is "taka-diastase", or the active principle of Koji extracted by means of alcohol. The author has extracted a new diastase from Koji, having the same reducing power as *philothion*, but not possessing any hydrogenizing properties with regard to sulphur; he proposes the name *reductase* for this series of products.—Chem. News, Jan. 23, 1902, 48; from Compt. rend., *135*, No. 26, Dec. 29, 1902.

*Vegetable Rennet—Occurence in Numerous Plants.*—Javillier finds that the juices of a number of plants contain a ferment which has the property of coagulating milk, similar to the ferment of rennet. He enumerates the following plants: *Lolium perenne*, *Anthriscus vulgare*, *Plantago lanceolata*, *Capsella bursa-pastoris*, *Geranium molle*, *Ranunculus bulbosus*, *Medicago lupulina*, *Lamium hybridum*, *Lamium amplexicaule*, and *Philadelphus coronarius*. The character of this vegetable rennet is exemplified by the author in the case of *Lolium* juice. This is slightly acid; the ferment is most active at 45° C., and does not act at low temperatures from 0° to

15° C., while its activity rapidly diminishes between 50° and 60° C., and is almost destroyed at 70° C. The ferment acts best in a slightly acid medium, while alkalies retard its action. The ferment is precipitated by alcohol, but the precipitate has a very powerful coagulating action on milk casein.—Pharm. Journ., July 19, 1902, 41 ; from Compt. rend. *134*, 1373.

*Antiferments—Constituents of Intestinal Worms.*—E. Wieland states that by adding alcohol to the juice obtained by expressing parasitic worms a precipitate is obtained which has the powers antagonistic to pepsin and trypsin, so that fibrin impregnated with it is rendered resistant to the action of proteolytic ferments. The author believes that the parasites are thus protected from digestive action in the intestines of animals by the presence of substances in their tissues which can inhibit the action of digestive ferments.—Chem. Zeit. Rep., 1902, 358 ; from Ztsch. Biolog., 1902.

*Animal Membranes—Comparative Permeability when Living and Dead.*—G. Galeotti has made a comparative study of the permeability of living and dead animal membranes by measurement of their electrolytic resistance. The living membranes were first investigated, and then, after remaining in chloroform vapor for some time, were again placed in the electrolytic cell, and the resistance of the solution measured as before. Various salt solutions were employed, the strengths of these being in the majority of cases one-tenth normal. The resistance of membranes, which in the animal body separate solutions of different nature and concentration from one another, was found to be ten to forty times greater in the living condition than when the membranes are dead. The resistance of membranes, which have no functions of this character in the animal system, is, on the other hand, unaltered by the action of chloroform vapor. The conclusion is drawn that members of the first class, for example, from the cæcum of the rabbit and the bladder of the turtle, behave as semi-permeable membranes in the living condition, but this semi-permeability is lost when the cells are dead. Membranes of the second class, on the other hand, act simply as diffusion membranes, and the permeability of those is the same whether living or dead.—Pharm. Journ., July 19, 1902 ; from Arch. di Biologia Norm. patol., through Nature, *66*, 256.

*Gelatin—Commercial Quality.*—Bernard finds that all commercial gelatin has an acid reaction, due either to hydrochloric, phosphoric or sulphuric acid. He finds the average loss of weight after drying them at 100° C. for twelve hours to be 18 per cent., the method of storage having considerable influence on their content by reason of the hygroscopic nature of gelatin in damp air. The melting point of a 1 per cent. jelly, as determined by the rounding of the edges of sharp-cut slices attached direct to the thermometer, and immersed in water, was found to be 19° C.—Pharm. Ztg., 1902, 1007.

*Toxins—Modern Theories on Their Nature and Action.*—Dr. Torald Sollmann observes that the experimental study of the action and production of toxins and anti-toxins, which has been so actively pursued in the last decade, has brought to light a large number of results which have a very wide significance. These called loudly for an explanation which would render them intelligible, and to supply such, a complicated structure of brilliant hypotheses has been evolved, mainly by Ehrlich. These fulfill admirably the purposes of working hypotheses, in that they furnish a guide in experimentation and aid in grasping facts, and they have in this way proved themselves very useful. A clear understanding of them is, therefore, very important to every one who aims to keep in touch with the progress of natural science. These theories attribute to the toxins and antitoxins properties which are familiar in ordinary chemical molecules, and the theories are most easily understood if they are treated and illustrated as chemical theories. This Dr. Sollmann has attempted in an admirable paper, published in the Bulletin of Johns Hopkins Hospital, *13*, 285, to which the reader has access by consulting a reprint of the paper in Amer. Journ. Pharm., March, 1903, 101–108.

*Cytotoxins—A New Class of Cellular Poisons.*—By injecting an emulsion of thyroid gland, mixed with a small amount of sodium chloride, into the abdominal cavity of cats, Mankousky found that after three injections the cat's serum was poisonous to the functions and cells of the thyroid body. Injected into the blood, the abdominal cavity, or the thyroid parenchyma of a dog, it caused symptoms similar to those which follow removal of the gland. A microscopic examination of sections of the thyroid showed a diminished amount of colloid substance, and a change in the lobules, with swelling of the cells and cavities in the parenchyma.—Pharm. Journ., Feb. 7, 1903, 161; from Russ. Arkhiv. Patol., 1902.

*Anti-Diphtheria Serum—Question of Pharmacopœial Recognition.*—Thomas Maben comprehensively discusses the question of the official recognition of anti-diphtheria serum. At the outset, two conditions require to be met. The first is, has it passed the experimental stage? the second, is its importance such that it demands recognition by insertion in the Pharmacopœia? In the author's opinion both of these questions must be answered in the affirmative. Subservient to these leading questions come others: Is it practicable to draw up a monograph giving tests and such other particulars as will meet the object in view? and then, is it necessary? These points are discussed at length by the author who arrives at the positive conclusion that anti-diphtheria serum ought to be officially recognized in the Pharmacopœia, and that, in order to have a satisfactory guarantee, the most feasible plan is that adopted in Germany —namely, to have an official certification of every container. This is not only quite practicable, but is apparently the only practicable method. It may not be practicable, as it certainly is not essential, to have a Govern-

ment laboratory for the preparation of the serum, but it is perfectly practicable to have a laboratory where all needful tests could be carried out, and where arrangements could be made to have the serum filled and every container certified by the official appointed for the purpose. Whether this official be appointed by the Government or by other competent authority, he ought to be a man of eminence as a bacteriologist and pharmacologist, and one whose certificate would be accepted absolutely without question.—Trans. Brit. Pharm. Conf., 1902, 453–471.

*Antidiphtheritic Serum—Limit of Stability.*—Chialdini observes that antidiphtheritic serum appears to keep well for two years, but its activity is considerably diminished after three years, and the serum becomes inactive after four years' keeping. The activity may be lost without any obvious alteration in the appearance of the fluid, while the presence of antiseptics or exposure to light under ordinary conditions appear to exercise little influence upon the change.—Pharm. Journ., May 16, 1903, 675; from Journ. de Pharm. et Ch., 1903, 30.

*Scarlet-Fever Serum—Successful Use.*—At the meeting of the German Naturalists and Physicians, held at Carlsbad, September 21–27, 1902, Dr. Paul Moser made an interesting report on the successful use of serum in the treatment of scarlet fever. He states that scarlet-fever serum has been used very successfully in a series of eighty cases in Vienna.—Amer. Journ. Pharm., Dec., 1902, 600.

*Serpent Venom—Characters of Ferment.*—C. Delezenne finds that the venom, both fresh and dried, of the cobra, the adder, and the puff-adder, all contain a peculiar ferment, a kinase, which, although itself without proteolytic action on albumin, is liable to impart to pancreatic juice a very powerful digestive action on that substance. This ferment is entirely destroyed by heating the venom to 100° C. for fifteen minutes. The poison of the puff-adder is the most active in this respect, 0.5 to 1 Mgm. of the venom being sufficient to enable 1 Cc. of the pancreatic juice to digest 50 Cgm. of the albumin in ten or twelve hours. Cobra poison was found to be slightly less active in this respect, while that of the viper had a marked lower proteolytic action, five or ten times more being requisite to produce the same effect. This kinase appears to resemble in its properties the ferments secreted by certain micro-organisms, and to possess the same action as the enterokinase of the intestinal juice. The part played by this substance in serpent venom is being investigated.—Pharm. Journ., Oct. 4, 1902, 336; from Comptes rend., *136*, 328.

*Vaccine Lymph—Use of Chloroform in the Preparation.*—A. B. Green recommends, in place of glycerinated vaccine lymph, the use of a lymph from which extraneous bacteria have been eliminated by the use of a saturated solution of chloroform in distilled water. It is stated that the extraneous bacteria are eliminated in from one to six hours, but the specific

germ remains fully potent for vaccination. After the chloroform has done its work it can be evaporated off entirely, and another advantage is that the vaccine could be distributed within a few hours of its collection from the calf.—Pharm. Journ., May 16, 1903, 675; from Proc. Royal Society.

*Serpent Venom—Specific Nature.*—The experiments of Dr. Tidwell with antivenomous serums in Australia show that these serums are only active as a remedy against the specific poison which has been employed in its production, and that the antitoxin from the venom of one species of snake is ineffective as a remedy for the bite of another kind. Thus he found that the serum of Calmette, obtained from horses inoculated with cobra venom, is not efficient against the venom of Australian snakes. Even when used in large doses, it failed to react against a single lethal dose of the poison of the tiger snake. Serum obtained, however, from horses inoculated with tiger-snake venom, was found to be perfectly effective against the lethal doses of that poison, but not so towards the poison of the Australian black or brown snake or the puff-adder.—Pharm. Journ., Jan. 24, 1903, 90; from B. M. J., Feb., 1902, 1918 and Austral. Med. Gaz.

*Serpent Venom—Comparative Study of Nature and Physiological Action.*—Lamb and Hanna have experimented on the nature and physiological action of the venom of Russell's Viper,

*Daboia Russellii.* They find that daboia venom owes its toxic property chiefly to its action upon the blood, the rapid death which results being mainly due to extensive clotting of the blood in the blood-vessels. By heating a weak solution of the venom (0.1 per cent.) for half an hour to 73° C., the toxity is completely destroyed, though a more concentrated solution (1 per cent.) may have its toxity only lessened by this treatment. Daboia venom contains no toxic element, having an action similar to that of

*Cobra venom,* which also contains a toxic albumose; but the latter acts specially upon the central nervous system and contains no substance causing intravascular clotting. Moreover, Calmette's anti venin, which has a powerful neutralizing action for cobra venom, possesses little or no such property for daboia venom.—Pharm. Journ., June 13, 1903, 811; from Scient. Memoirs of the Government of India, No. 3.

*Epinephrin—A Constituent of the Suprarenal Gland.*—Dr. J. J. Abel has isolated from the suprarenal gland a constituent that has the property of raising the blood pressure, to which he has given the name "Epinephrin." It is found more or less impure in the various preparations of adrenalin, and is prepared by the author as follows: A concentrated aqueous solution of the gland is prepared by repeatedly extracting the minced glands with water just acidulated with acetic acid, then boiling, filtering and concentrating the solution. Of this 200 Cc. is placed in a tall cylinder, and 1,800 Cc. of absolute alcohol is added, a small quantity at a time, with constant shaking. After standing for some hours the alcoholic liquor is

separated and the alcohol distilled off under diminished pressure. This yields a straw-colored syrup which on cooling congeals to a paste. This is dissolved in an ammoniacal solution of zinc chloride, precipitated with absolute alcohol, and the precipitate filtered off. The filtrate is again concentrated, dissolved in the ammoniacal zinc chloride and re-precipitated with alcohol. The two precipitates, which are epinephrin in the form of a zinc compound, are dried, powdered, dissolved in dilute acetic acid, treated with hydrogen sulphide, filtered, and the filtrate concentrated; when to this filtrate ammonia is added, a mass of crystals is precipitated which is impure epinephrin, and may be purified by re-solution in acid and precipitation with ammonia. The substance has the formula $C_{10}H_{11}NO_3$. —Johns Hop. Hosp. Bull., 13, 1902, 29.

*Thyroidinase—A Soluble Ferment from the Thyroid Gland.*—Marcel Monier has isolated a soluble ferment from the thyroid gland, to which he gives the name thyroidinase. The ferment may be prepared from either the dried or fresh glands. The glands are cut into small pieces, and macerated with water for two hours; the whole is then subjected to pressure. The liquor thus obtained is treated with phosphoric acid which precipitates certain impurities. Excess of acid is then removed by treatment with lime water. After filtration the liquid is evaporated to dryness *in vacuo* or in an air oven at a temperature below 40° C. A fine white powder is thus obtained, which is soluble in water and glycerin, and is precipitated by alcohol. In order to purify the product it is necessary to wash repeatedly with alcohol.—Pharm. Journ., Nov. 8, 1902, 463; from Journ. de Pharm. d'Anvers, *58*, 361.

*Spleen—Products of its Proteolytic Enzyme.*—J. B. Leathers has investigated the products formed by the action of the proteolytic enzyme found by S. Hedin and S. Rowland in the spleen, and determined by them to act most strongly in an acid solution. These products comprise histidin, arginin, and lysin. Neither xanthin bases nor diamines were isolated. Aspartic acid was found in large quantities, leucin and amido-valerianic acid were also found, but not glutamic acid.—Pharm. Journ., Feb. 7, 1903, 161; from Journ. of Physiology, *28*, p. 360.

*Liver Extract—Remedial Value.*—Trentas recommends a liver extract for the treatment of ocular affections accompanying jaundice, a suitable extract for this purpose being obtained according to Bras as follows: Disintegrated liver tissue, 10; macerate for twenty-four hours in glycerin, 10; add boiled solution of salt (1:4), 5; macerate for half an hour, filter, and sterilize. Dose, 3 Cc. by hypodermic injection. Gilbert and Carnot state that only the livers of animals fed on milk should be employed, since these are less toxic. They recommend the use of liver powder which is obtained by scraping the gland with a knife and drying the pulp *in vacuo* at 27° C.—Pharm. Journ., Feb. 28, 1903, 340.

*Iron Neucleinate—Superiority Over Other Iron Compounds.*—Louis Dar

states that iron neucleinate, $C_{40}H_{32}N_{14}(Fe_2O_3)_4(P_2O_5)_28H_2O$, the form in which iron exists in eggs, is the only iron compound which is not converted into chloride by the gastric secretion. All other iron compounds are converted into chloride, and as soon as they reach the alkaline juices of the duodenum, into oxide. Iron neucleinate is stated to be quite harmless in large doses. From experiments conducted with rabbits, it is shown to cause a marked increase of iron in the liver. The salt used was prepared from casein and also from fish roes. It is recommended as being worthy of further clinical experiment.—Pharm. Journ., Nov. 8, 1902, 483; from B. M. J. Epit., Feb., 1902, *16*.

*Osseomucoid—A New Constituent of Bone.*—W. J. Grès describes a new constituent of bone, "osseomucoid," obtained by the following process: Fresh bones, freed from fat and muscle and connective tissues, were soaked in hydrochloric acid (0.2–0.5 per cent.) for a few hours, then scraped with a strong, sharp scalpel, again soaked in acid and scraped, and the process repeated until the whole bone was reduced to shavings, free from organic matter. The shavings were then minced, and the fine material repeatedly treated with half-saturated lime-water. On acidifying the filtered extract with 0.2 per cent. hydrochloric acid a bulky flocculent precipitate separated. This gave the general proteid reactions and appeared to have the same solubilities and precipitative reactions as other connective-tissue mucoids, yielding the same amount of reducing substance on decomposition with mineral acids.—Pharm. Journ., Jan. 3, 1903, 1; from American Medicine, Nov. 23, 1901, 820.

### URINARY COMPOUNDS, ETC.

*Urine — Microscopic Study, Technique for Permanent Mounts and Method of Making Records.*—L. Napoleon Boston, A. M., M. D., bacteriologist to the Philadelphia Hospital, introducing the subject of a lecture, observed that owing to the variable number of gateways through which error may pass in the microscopic analysis of urine, a careful, systematic technique, sufficiently broad in its scope that it may be bounded on the one hand by the method for the collection of the specimen, and on the other by the ultimate results of such studies, is needed. Give the amateur microscopist such a guide and he can soon equip himself with a collection of specimen slides equal in every way to those the lecturer exhibited; moreover, he will acquaint himself so thoroughly with these specimens, from their repeated study, that the knowledge of them becomes part of himself and ceases to be one of question. How this is best done is the object of Dr. Boston's interesting lecture, his subject being considered under the following separate headings: Method for collecting and preserving the gross specimen; method of study; staining; microscopic study; the making of records. It is impracticable here to consider these various steps in condensed abstract, which can be profitably consulted only in

their entirety as given in a paper communicated to Amer. Journ. Pharm., March, 1903, 111–115.

*Urine—Simple Test for Albumen without Reagents.*—According to a statement in "J. de Ph. d'Anvers," a very simple test for the presence of albumin in urine is to pour a single drop of urine into a test glass containing boiling distilled water. If albumin be present, there is produced, as the drop falls through the liquid, a thoroughly characteristic opalescence like the smoke of a cigar. This test is especially recommended when a very small quantity of urine is available for analysis.—Pharm. Journ., Jan. 24, 1903, 90; from Rev. Med. Pharm.

*Urine—Tests for Bile-Pigments.*—W. Harrison Martindale has investigated the relative value of the following tests for bile-pigments: Gerhardt's, as employed by von Jaksch, Rosin's iodine test, Ultzmann's, Huppert's, Ehrlich's and Gmelin's. The author finds that Gmelin's test is, on the whole, the most completely reliable. In the application of this test, the text-books usually recommend that the specimen of urine under examination be poured onto fuming nitric acid, or nitric acid containing a proportion of nitrous acid; but in his experience the ordinary acid, sp. gr. 1.42, of the B. P., will answer quite as well. In each instance the typical play of colors, violet-ring and green coloration due to oxidation and production of biliverdin were obtained; but the fuming acid has the disadvantage that it may produce marked evolution of gas, and thus completely upset the attempt to obtain the ring.—Chem. and Drug., Jan. 31, 1903, 171.

*Urine—Modification of Huppert s test for Bile.*—Nakayama recommends the following modifications of Huppert's test for bile on account of its greater sensitiveness; Five Cc. of the urine are treated with an equal volume of a ten per cent. barium chloride solution and centrifugated. The precipitate is collected and boiled with 2 Cc. of alcoholic solution of ferric chloride (4 Gm. $Fe_2Cl_3$, 1 Gm. $HCl_g$, and 99 Gm. of 95 per cent. alcohol.) In the presence of bile the boiled liquid assumes a light-green or bluish green color and, on the addition of fuming nitric acid. passes to violet, then to red. The reaction will show one part of bile in 1, 200-, 000 of urine.—Pharm. Journ., March 28, 1903, 454.

*Urine—Isolation and Characters of Crystalline Coloring Matter.*—S. Cotton has succeeded in isolating in a crystalline condition from urine a coloring principle similar to hæmin. Two and a half liters of normal urine is treated with 100 Gm. of pure $HNO_3$ and evaporated to 500 Cc. in a long-necked flask, so as to avoid contact with the air. The liquid is then cooled and filtered, when the whole of the coloring matter is filtered out accompanied by brownish-black carbonaceous matter. On treating this residue on the filter with ether or chloroform the coloring matter is dissolved, giving a fine red solution. This is then shaken out with very dilute aqueous alkali to remove resinoid impurities, traces of fat, and of

benzoic acid, which are always present; after which the liquid is again washed by shaking out with water, filtered through a dry filter, and allowed to evaporate spontaneously. In this manner a crop of deep violet, prismatic crystals is obtained, which are insoluble in water but readily dissolved in chloroform, ether, and toluene. They resinify on keeping, but may be preserved in glacial acetic acid, with which they possibly form a compound analogous to that of hæmin with that acid. The solutions of this body give spectroscopic absorption bands similar to, but not identical with, those of hæmatin. This substance is not an oxidation product; it may be obtained by treating urine with HCl instead of $HNO_3$. It is not precipitated by basic lead acetate, but is removed by animal charcoal. The author attributes the so-called indican reaction with urine to the presence of this body. Although amorphous coloring substances have previously been isolated by the method described, no crystalline body appears to have been previously recorded.—Pharm. Journ., Oct. 4, 1902, 336; from Journ. Pharm. Chim., [6], *16*, 258.

*Urine—Detection of Bile by Means of Fuchsine.*—Badouin uses a 1 : 200 aqueous solution of fuchsine as a reagent to detect bile pigments in urine. Two test-tubes are taken, one of which is three parts filled with urine, the other with a similar volume of distilled water. To each two drops of the aqueous fuchsine is added. In the presence of bile pigments, the reddish-violet color of fuchsine is changed to a deep orange color. If the urine be very dark colored it should first be diluted with enough water to produce a normal tint before adding the fuchsine reagent. The presence of bilirubin and of indican does not affect the reaction.—Pharm. Journ., March 21, 1902; from Reportoire. [3]. *15*, 12.

*Urine—Detection of Blood.*—Frostman detects the presence of blood in urine in the following manner. To 10 Cc. of urine, 1 Cc. of ammonium sulphide is added, and a similar quantity of pyridine. The urine, if blood be present, assumes a more or less deep orange color according to the quantity existing. Although very delicate, the sensitiveness of the reaction is much increased by the use of the spectroscope, by means of which the presence of the smallest trace of hæmochromogen may be detected; so the presence of blood may be established even when no color reaction, visible to the naked eye, is obtained.—Pharm. Journ., Jan. 31, 1903, 125; from Nouv. Remèdies, *18*, 427.

*Urea—Remarkable Effect upon Certain Proteids.*—W. Ramsden finds that dry gelatin is dissolved in a saturated solution of urea at room temperature to the amount of 40 per cent., the solution remaining liquid, but that the gelatin will set again if the urea is dialyzed out of the solution. Coagulable proteids dissolved in urea solution do not coagulate on boiling; the proteids being converted, even in the cold, into acid or alkali albumins, according to the original reaction of the solution. Globulins,

caseinogen, acid and alkali albumin, copper albuminate, fibrin, and even heat-coagulated proteids swell up and dissolve in a saturated aqueous solution of urea. Urea, moreover, has a marked accelerating effect upon peptic or tryptic digesting fluids.—Pharm. Journ., Mar. 14, 1903, 385; from Proc. Physiol. Soc., 1902, ii, 22.

*Urea—Decomposition.*—C. E. Fawsitt has studied the decomposition of urea into ammonia and carbon dioxide in aqueous solution at 99° C. The reaction in presence of either acid or alkali would be expected theoretically to be bi- or tri-molecular, but the experimental results show that in these cases, and also when pure water is used as the solvent, decomposition proceeds in accordance with the formula of a mono-molecular reaction. This apparent anomaly is explained by assuming the formation of an intermediate product, namely, of ammonium cyanate; further, the presence of this salt in the solution, as an intermediate product and not as a by-product, has been proved.—Chem. News, *86*, 175.

*Urea and Uric Acid—Chromic Acid Method of Estimation.*—After explaining the nature of the reaction between uric acid and permanganate in acid solution, which has hitherto not been understood, J. F. Tocher showed that alloxan is formed during the titration of uric acid by Hopkins' method, and that the substance is acted upon by permanganate, producing the variability of results obtained by this method. He has further investigated the properties of alloxan, and shows that it reacts with ammonia in a manner similar to alloxantin. Alloxan, and not alloxantin, is shown to be the chief cause of the coloration caused by treating the urinary residue with strong nitric acid. The intermediate products of oxidation formed by boiling uric acid with acid permanganate are alloxan, alloxantin and parabanic acid, and the final product is urea. As urea reduces permanganate considerably, the determination of uric acid by boiling with excess of permanganate cannot be carried out. The author shows that the figures given by Jolles are not attainable for this reason, and then he proceeds to describe his own method of determining uric acid by means of chromic anhydride, which quantitatively converts urates into urea. Two methods are given by the author—(1) for urine low in urates, (2) for ordinary clinical work. Method No. 1 determines uric acid with great precision. After the urates have been precipitated as acid ammonium urate, the precipitate is dissolved and treated with chromic acid. The urea formed is acted upon by hypobromite in a special reaction-flask, using potassium cyanate as recommended by Allen. The whole of the nitrogen present is evolved, and is measured in an ordinary gas-burette. Method No. 2 involves the construction of a special hypobromite tube, into which the oxidized uric solution is placed, and the nitrogen evolved read off as uric acid per cent. of the sample used. This process is most suitable for clinical work, enabling operators to determine accurately both uric acid and urea in a few minutes.—Trans. Brit. Pharm. Conf., 1902, 404–415.

# APPENDIX.

## ALPHABETICAL LIST OF NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED BY THE TREASURER FOR ANNUAL DUES AND CERTIFICATES, FROM JULY 1, 1902, TO JULY 1, 1903.

| | Annual Dues. | Certificates. |
|---|---|---|
| Abbett, William A.....'02 | $5 00 | |
| Adamick, Gustave H.....'03 | 5 00 | |
| Adams, Arthur E.....'02-'03 | 10 00 | |
| Aimar, Charles P.....'03 | 5 00 | |
| Allen, E. Floyd .....'03 | 5 00 | |
| Allen, Grafton C .....'02 | 5 00 | |
| Allen, William H .....'02 | 5 00 | |
| Alexander, Chas. E.....'02 | 5 00 | |
| Allison, William O.....'03 | 5 00 | |
| Alpers, William C.....'02-'03 | 10 00 | |
| Amend, Bernard G .....'03 | 5 00 | |
| Anderson, Samuel.....'02 | 5 00 | |
| Anderson, William C.....'03 | 5 00 | |
| Andreen, Carl .....'02-'03 | 10 00 | |
| Andriessen, Hugo.....'03 | 5 00 | |
| Anglum, John ... .....'02 | 5 00 | $5 00 |
| Appelbaum, Jerome .....'02 | 5 00 | 7 50 |
| Appleton, William R.....'02 | 5 00 | |
| Aquaro, Joseph .....'02 | 5 00 | |
| Argenti Jerome J. B.....'99-'00 | 10 00 | |
| Arny, Harry V.....'02-'03 | 10 00 | |
| Arrington, Homer B.....'01-'02 | 10 00 | |
| Aughinbaugh, David C.....'03 | 5 00 | |
| Averill, William H.....'03 | 5 00 | |
| Axness, Ole M... .....'03 | 5 00 | |
| Baer, Jacob M .....'02-'03 | 10 00 | |
| Bailey, Frederick.....'03 | 5 00 | |
| Baird, Julian W.....'03 | 5 00 | |
| Baker, Edwin.....'03 | 5 00 | |
| Baker, Howard S .....'02 | 5 00 | |
| Baker, T. Roberts.. .....'03 | 5 00 | |
| Ball, Charles E.....'02-'03 | 10 00 | |
| Ballagh, Wilfred T.....'03 | 5 00 | |
| Balser, Gustavus.....'03 | 5 00 | |
| Barbat, Josephine E.... ....'02 | 5 00 | |
| Barbot, Julian A .....'02 | 5 00 | |
| Bard, William E .....'03 | 5 00 | |
| Baridon, Louis R.....'02-'03 | 10 00 | |
| Barksdale, George E .....'01 | 5 00 | |
| Barnett, Joel J.....'02-'03 | 10 00 | |
| Barrett, Charles L.....'02 | 5 00 | |
| Bartells, George C.....'02-'03 | 10 00 | |
| Barth, George F.....'01-'02-'03 | 15 00 | |
| Bartley, Elias H .....'03 | 5 00 | |
| Bartmer, Adolph H .....'02 | 5 00 | |
| Base, Daniel..... .....'03 | 5 00 | |
| Batt, Bruno.....'02 | 5 00 | |
| Batt, Herman.....'02 | 5 00 | |
| Battle, Orrin McR .....'02 | 5 00 | |
| Bayly, Charles A .....'02 | 5 00 | |
| Beal, James H .....'02-'03 | 10 00 | |
| Beck, Henry M.....'02 | 5 00 | |
| Beck, John G..... .....'02 | 5 00 | |
| Becker, Charles L.....'02-'03 | 10 00 | |
| Behrens, Emil C. L.....'03 | 5 00 | |
| Beitenman, William W .....'02 | 5 00 | |
| Bell, S. Howard..... ....'02 | 5 00 | |
| Berger, Ernest .....'02-'03 | 10 00 | 5 00 |
| Amount carried forward..... | $370 00 | $17 50 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward ..... | $370 00 | $17 50 |
| Beringer, George M.....'03 | 5 00 | |
| Bernheim, Moses R .....'02 | 5 00 | |
| Bernstein, Michel.....'02-'03 | 10 00 | |
| Berryhill, Henry P.....'03 | 5 00 | |
| Bethea, Oscar W .....'02-'03 | 10 00 | |
| Betzler, Jacob.....'02 | 5 00 | |
| Beyschlag, Charles.....'03 | 5 00 | |
| Bigelow, Clarence O.....'03 | 5 00 | |
| Billings, Henry M .....'03 | 5 00 | |
| Bingham, Charles C .....'02-'03 | 10 00 | |
| Blackmore, Henry S.....'01-'02 | 10 00 | |
| Blanding, William O .... ...'03 | 5 00 | |
| Blank, Alois .....'02 | 5 00 | |
| Blumauer, Louis .....'02 | 5 00 | |
| Boerner, Emil L .....'02 | 5 00 | |
| Boesewetter, Richard.....'02 | 5 00 | |
| Bohmansson, Robert H.....'03 | 5 00 | |
| Bolink, Elebertus.....'02-'03 | 10 00 | 5 00 |
| Bond, Jackson N..... ....'02 | 5 00 | |
| Bond, John B .....'02-'03 | 10 00 | |
| Bond, John B., Jr .....'02-'03 | 10 00 | |
| Bonnette, J. Valarus .....'02 | 5 00 | 7 50 |
| Borell, Henry A .....'03 | 5 00 | |
| Bories, Emil .....'02 | 5 00 | |
| Bostick, Elmer E.....'02 | 5 00 | |
| Bowen, William A .....'00 | 5 00 | |
| Bowerman, Kenneth B .....'02 | 5 00 | |
| Boyd, Charles N .....'02-'03 | 10 00 | |
| Boyd, George W .....'02 | 5 00 | |
| Boyken, John W.....'02 | 5 00 | |
| Boynton, Herschell.....'02 | 5 00 | |
| Brack, Charles E... .....'03 | 5 00 | |
| Bradbury, Wymond H .....'02 | 5 00 | |
| Bradham, Caleb D .....'02 | 5 00 | |
| Brandenberger, Adolph.....'02 | 5 00 | |
| Brecht, Frederick A .....'03 | 5 00 | |
| Breunert, August .....'02-'03 | 10 00 | |
| Brewer, Howard D..... ....'02 | 5 00 | |
| Brickman, Arthur O. .....'03 | 5 00 | |
| Briggs, Andrew G....'00-'01-'02 | 15 00 | |
| Broe, James A. .....'02 | 5 00 | |
| Brookes, Virginia C.....'02 | 5 00 | |
| Brooks, George W .....'03 | 5 00 | |
| Brown, Albert E.... .....'02 | 5 00 | |
| Brown, Charles M .....'02 | 5 00 | |
| Brown, George S.....'01 | 5 00 | |
| Brown, William A .....'02 | 5 00 | |
| Brown, William T.....'02 | 5 00 | |
| Brucker, Carl .....'02-'03 | 10 00 | 5 00 |
| Brundage, Albert H .....'02-'03 | 10 00 | |
| Brunner, Norman I ..'00-'01-'02 | 15 00 | |
| Burg, John D..... .....'03 | 5 00 | |
| Burge, James O.....'00 | 5 00 | |
| Burgheim, Jacob.....'02 | 5 00 | |
| Burke, William H .....'02-'03 | 10 00 | |
| Burkhardt, Mark A ..'00-'01-'02 | 15 00 | |
| Burnett, George G .....'02 | 5 00 | |
| Amount carried forward..... | $745 00 | $35 00 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward ..... | $745 00 | $35 00 |
| Burnham, Alfred A., Jr. ..... '03 | 5 00 | |
| Burrough, Horace ..... '02 | 5 00 | |
| Burrough, Horace, Jr. ..... '02 | 5 00 | |
| Burton, John C..... ..... '02 | 5 00 | |
| Butler, Charles H. ..... '03 | 5 00 | |
| Butler, Freeman H..... '03 | 5 00 | |
| Caldwell, Joseph F. ..... '02 | 5 00 | |
| Campbell, Albert A. ..... '02 | 5 00 | |
| Campbell, Charles B..... '02 | 5 00 | |
| Campbell, Milton..... '02–'03 | 10 00 | |
| Campbell, Theodore..... '02–'03 | 10 00 | |
| Capdau, Pierre A. ..... '02–'03 | 10 00 | |
| Carslake, George M..... ..'02 | 5 00 | |
| Carter, Frank H..... '03 | 5 00 | |
| Caspari, Charles, J ..... '03 | 5 00 | |
| Caspari, Charles E..... '02 | 5 00 | |
| Casper, Thomas, Jr..... '03 | 5 00 | |
| Castlehun, Karl..... '02–'03 | 10 00 | |
| Chandler, Charles F. ..... '03 | 5 00 | |
| Cheatham, Thomas A..... '02 | 5 00 | |
| Chesnutt, James A..... '02–'03 | 10 00 | |
| Civins, Albert I. ..... '02 | 5 00 | 7 50 |
| Clark, Alfred W. ..... '02 | 5 00 | |
| Clark, John A..... '02 | 5 00 | |
| Claus, Otto F. ..... '02 | 5 00 | |
| Cleveland, Jule M..... '02 | 5 00 | |
| Cliffe, William L..... '02–'03 | 10 00 | |
| Cline, Raoul R. D. ..... '02–'03 | 10 00 | |
| Cobb, Ralph L..... '03 | 5 00 | |
| Coblentz, Virgil..... .....'02 | 5 00 | |
| Cole, Victor L.... ..... '02 | 5 00 | |
| Colegaris, Joseph ..... '02 | 5 00 | |
| Coleman, John H. ..... '02 | 5 00 | 7 50 |
| Colen, James A. .....'00–'01–'02 | 15 00 | |
| Collins, Albert B. ..... '03 | 5 00 | |
| Collins, Mary E..... '02 | 5 00 | |
| Cone, Earl H. ..... ...'02 | 5 00 | |
| Cone, John W..... '03 | 5 00 | |
| Conger, Frederick A..... '02 | 5 00 | |
| Conrad, John ..... ..... '00 | 5 00 | |
| Cooban, Benj. S. ..... '02–'03 | 10 00 | |
| Cook, Alfred P. ..... '02 | 5 00 | |
| Cook, E. Fullerton ..... '02–'03 | 10 00 | |
| Cook, Thomas P..... ....'03 | 5 00 | |
| Cookson, Joseph W. ..... '02 | 5 00 | |
| Cornell, Edward A. ..... '02 | 5 00 | |
| Cornell, Edward C..... '02 | 5 00 | |
| Corning, Albion J. ..... '03 | 5 00 | |
| Cowan, John ..... '02–'03 | 10 00 | |
| Cramer, Max ..... '03 | 5 00 | |
| Crampton, Ferd L..... '03 | 5 00 | |
| Crawford, Frank E..... '02–'03 | 10 00 | |
| Crecelius, Charles E ..... '02 | 5 00 | |
| Criswell, Francis M. ..... '02 | 5 00 | |
| Crowdle, John E..... .....'02 | 5 00 | |
| Crum, John D..... '00 | 5 00 | |
| Culbreth, David M. R...'02–'03 | 10 00 | |
| Cureton, George D. ..... '02 | 5 00 | |
| Curry, David W..... '03 | 5 00 | |
| Dadd, Robert M..... '03 | 5 00 | |
| Daggett, Charles H..... '02 | 5 00 | |
| Daggett, V. Chapin ..... '03 | 5 00 | |
| Dahlbender, George..... '02 | 5 00 | |
| Daly, James E. ..... '02 | 5 00 | |
| Danek, John F..... '02–'03 | 10 00 | |
| Dare, Charles F. ..... '02 | 5 00 | |
| Davidson, Edgar C. ..... '02 | 5 00 | |
| Davies, John I..... ....'02 | 5 00 | |
| Davies, Llewellyn P. ..... '02 | 5 00 | |
| D'Avignon, J. Eugene ...'01–'02 | 10 00 | |
| Davis, Charles L. ..... '03 | 5 00 | |
| Davis, Eugene M ... ....'02–'03 | 10 00 | |
| Davis, John A..... '00–'01 | 10 00 | |
| Davis, William M. ..... '02 | 5 00 | |
| Dawson, Edward S., Jr...'02–'03 | 10 00 | |
| Amount carried forward..... | $1215 00 | $50 00 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward ..... | $1215 00 | $50 00 |
| Dawson, John H. ..... '02 | 5 00 | |
| Day, Edward J. ..... '03 | 5 00 | |
| Day, William B. ..... '02 | 5 00 | |
| De Jonge, Cornelius..... '03 | 5 00 | |
| De Lang, Alfred ..... '02 | 5 00 | |
| De Lorenzi, Albert ..... '02 | 5 00 | |
| Deck, Lewis C. ..... '03 | 5 00 | |
| Deemer, George M. H..... '02 | 5 00 | |
| Dennin, Charles ..... '00–'01–'02 | 15 00 | |
| Dennin, Edwin C..... '00–'01–'02 | 15 00 | |
| Dewender, William H. ..... '03 | 5 00 | |
| Dewoody, William L..... '03 | 5 00 | |
| Dickinson, Arthur L.... ....'02 | 5 00 | |
| Dickman, Gustave A..... '02 | 5 00 | |
| Diebert, Thomas I..... '03 | 5 00 | |
| Diekman, George C..... '03 | 5 00 | |
| Dillenback, Garrett V. d. V..'02 | 5 00 | |
| Dixon, J. Marion..... '03 | 5 00 | |
| Dobbins, Edward T..... '03 | 5 00 | |
| Dodds, Richard N. ..... '02–'03 | 10 00 | |
| Dohme, Alfred R. L. ..... '03 | 5 00 | |
| Donnel, Cornelius P. ..... '02 | 5 00 | |
| Doty, Wirt P. ..... '02–'03 | 10 00 | |
| Dougherty, Samuel B..... '02 | 5 00 | |
| Douglass, Henry..... '02 | 5 00 | |
| Dowdy, Joseph F.. ...'97 to '02 | 30 00 | |
| Drach, George L..... '02–'03 | 10 00 | |
| Drake, Frederick T..... '02–'03 | 10 00 | |
| Drake, Wallace C. ..... '02–'03 | 10 00 | |
| Drechsler, Frank X. ..... '02 | 5 00 | |
| Drescher, August F..... '02 | 5 00 | |
| Dresser, George E. ..'01–'02–'03 | 15 00 | |
| Drew, Walter I..... '02 | 5 00 | |
| Drossel, August A. ..... '02 | 5 00 | |
| DuBois, William L. ..... '02 | 5 00 | |
| Duckett, Walter G..... '02 | 5 00 | |
| Duering, Henry C..... '02 | 5 00 | |
| Duggan, James ..... '02 | 5 00 | |
| Dulaney, Joseph F..... '02–'03 | 10 00 | |
| Dunn, John A. ..... '03 | 5 00 | |
| Dunning, H. A. Brown..... '02 | 5 00 | |
| Dunwody, Richard G. ...'00–'01 | 10 00 | |
| Durban, Sebastian C..... .. '00 | 5 00 | |
| Durkee, William C. ..... '02 | 5 00 | |
| Dutcher, Alfred L. ..... '02 | 5 00 | |
| Eads, Robert I. ..... '03 | 5 00 | |
| Easterday, Herbert C..... '02 | 5 00 | |
| Eaton, Harry E. ..... '02 | 5 00 | |
| Eaton, Harvey K..... '02 | 5 00 | |
| Eberle, Eugene G. ..... '03 | 5 00 | |
| Eberle, Herman T..... '02 | 5 00 | |
| Eccles, Robert G. ..... '02 | 5 00 | |
| Eckert, John..... '02 | 5 00 | 5 00 |
| Eckstein, Andrew J..... '03 | 5 00 | |
| Edwards, Frederick B. ..... '02 | 5 00 | |
| Ehrlicher, Henry M. ..... '02 | 5 00 | |
| Eigelberner, Harry B. ..... '02 | 5 00 | |
| Elbrecht, Oscar H..... ..'02 | 5 00 | |
| Elderdice, William J..... '02 | 5 00 | 5 00 |
| Eliel, Leo..... '02 | 5 00 | |
| Elkin, William S., Jr. ..... '02 | 5 00 | |
| Elliott, Charles H. ..... '02 | 5 00 | |
| Emanuel, Louis..... '03 | 5 00 | |
| England, Joseph ..... '02 | 5 00 | |
| Englander, Samuel ..... '02 | 5 00 | |
| Eppstein, Jacob ..... '02–'03 | 10 00 | |
| Ernst, Frank F..... ..... '02 | 5 00 | |
| Estabrook, Henry A..... '02 | 5 00 | |
| Esters von Krakau, Wm. .... '02 | 5 00 | |
| Euler, Frederick C..... '02 | 5 00 | |
| Evans, George B. ..... '02–'03 | 10 00 | |
| Evans, Joseph S..... '03 | 5 00 | |
| Ewell, Ervin E..... ..... '02 | 5 00 | |
| Faber, Walter E..... '03 | 5 00 | |
| Fairchild, Benj. T. ..... '02, '03 | 10 00 | |
| Amount carried forward..... | $1695 00 | $60 00 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward..... | $1695 00 | $60 00 |
| Fairchild, Samuel W.....'03 | 5 00 | |
| Falk, John C.....'02 | 5 00 | |
| Famulener, Lemuel W.....'02 | 5 00 | |
| Federmann, Wm. W.....'03 | 5 00 | |
| Feick, Charles .....'02 | 5 00 | |
| Feidt, George D.....'03 | 5 00 | |
| Fenner, Harvey A.....'02 | 5 00 | |
| Fieber, Gustavus A.....'03 | 5 00 | |
| Field, William C.....'02 | 5 00 | |
| Finch, Charles S.....'02 | 5 00 | |
| Fischer, Henry.....'02 | 5 00 | |
| Fischer, Henry J.....'02–'03 | 10 00 | |
| Fischer, Richard ..... .....'02 | 5 00 | |
| Fish, Charles F.....'02 | 5 00 | |
| Fisher, Dora C.. .....'02 | 5 00 | |
| Fisher, George W.....'03 | 5 00 | |
| Fisk, Frank E.....'02 | 5 00 | |
| Fleiner, Lewis..... '02 | 5 00 | |
| Fletcher, John W..... ..'03 | 5 00 | |
| Ford, Edgar E.....'02–'03 | 10 00 | |
| Forsyth, William K.....'02 | 5 00 | |
| Foster, J. Webb...'98–'99–'00–'02 | 20 00 | |
| Foster, John B.....'02–'03 | 10 00 | |
| Fouch, William M... .....'03 | 5 00 | |
| Foulke, James .....'03 | 5 00 | |
| Frames, J. Fuller.....'02–'03 | 10 00 | |
| Franzoni, Joseph D.....'02 | 5 00 | |
| Fraser, Horatio N. .... ....'03 | 5 00 | |
| Frauer, Herman F.....'03 | 5 00 | |
| French, Harry B.....'03 | 5 00 | |
| Frerichs, Frederick W. .....'02 | 5 00 | |
| Fricke, Frederick H.....'02 | 5 00 | |
| Frohwein, Richard.....'02 | 5 00 | |
| Frost, William A.....'02 | 5 00 | |
| Fry, Herman.....'02–'03 | 10 00 | |
| Frye, George C.....'03 | 5 00 | |
| Fulton, Peter McM...'02–'03–'04 | 15 00 | |
| Gable, Ralph B. .....'02 | 5 00 | |
| Gaesser, Theobald T.....'03 | 5 00 | |
| Gahn, Henry. .... .....'02 | 5 00 | |
| Gallagher, John C. .....'02–'03 | 10 00 | |
| Gamble, Stewart.....'02–'03 | 10 00 | |
| Gamer, Albert C. C.....'02 | 5 00 | |
| Gammon, Irving P.....'02 | 5 00 | |
| Gane, Eustace H.....'02 | 5 00 | |
| Gano, William H. .....'03 | 5 00 | |
| Garber, Elmer F. W. .....'03 | 5 00 | |
| Gardner, Robert W.....'03 | 5 00 | |
| Garrett, Oscar N.....'02 | 5 00 | |
| Gaus, Charles H..... .....03 | 5 00 | |
| Gayle, John W.....'03 | 5 00 | |
| Geddis, Frank.... .....'02 | 5 00 | |
| Geisler, Joseph F..... .....'03 | 5 00 | |
| Gessner, Emil A,.....'03 | 5 00 | |
| Gettel, J. Ralph E.....'02 | 5 00 | |
| Gibbard, George E .....'02 | 5 00 | |
| Gilbert, Robert B.....'02–'03 | 10 00 | |
| Gilpin, Henry B.....'03 | 5 00 | |
| Gleghorn, James S .....'02 | 5 00 | |
| Glick, Harry E.....'03 | 5 00 | |
| Glover, William H.....'02 | 5 00 | |
| Godbold, Fabius C.....'03 | 5 00 | |
| Godding, John G.....'03 | 5 00 | |
| Golden, Lee H.....'02 | 5 00 | |
| Good, James M.....'02 | 5 00 | |
| Goodale, Harvey G.....'02–'03 | 10 00 | |
| Gordin, Harry M.....'02 | 5 00 | |
| Gordon, Frederick T..... ...'02 | 5 00 | |
| Gordon, Jean.....'02–'03 | 10 00 | |
| Gorgas, George A.....'03 | 5 00 | |
| Gove, David M .....'02 | 5 00 | |
| Grace, William D.....'03 | 5 00 | |
| Graf, Carl A.....'02 | 5 00 | |
| Graham, Willard.....'02–'03 | 10 00 | |
| Grambois, Augustin. .....'00 | 5 00 | |
| Amount carried forward..... | $2150 00 | $60 00 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward..... | $2150 00 | $60 00 |
| Grant, Isaac.....'02 | 5 00 | |
| Gray, Margaret McC.....'02 | 5 00 | |
| Gray, William ..... '03 | 5 00 | |
| Green, Benjamin .....'03 | 5 00 | |
| Greene, William R.....'03 | 5 00 | |
| Gregorius, George ..... ...'03 | 5 00 | |
| Gregory, Willis G.....'02 | 5 00 | |
| Greve, Charles M.....'03 | 5 00 | |
| Grewe, Louis F.....'02 | 5 00 | |
| Griffith, Charles.....'02 | 5 00 | |
| Griffiths, Joseph.....'02 | 5 00 | |
| Gross, Charles E.....'02 | 5 00 | |
| Gross, William O.. .....'02–'03 | 10 00 | |
| Guerin, James F.....'02 | 5 00 | |
| Gundrum, George.....'02–'03 | 10 00 | |
| Haake, William H.....'03 | 5 00 | |
| Haddad. Saleem F .....'02–'03 | 10 00 | |
| Haffner, Jean C.....'02 | 5 00 | |
| Hagee, William P.....'02 | 5 00 | |
| Hahn, Charles W. J. B.....'02 | 5 00 | |
| Haines, Walter S.....'02 | 5 00 | |
| Haley, John B.....'02–'03 | 10 00 | 5 00 |
| Hall, Alden T.....'02 | 5 00 | |
| Hall, Edwin B..... '02–'03 | 10 00 | |
| Hall, Frank M.....'02 | 5 00 | |
| Hall, Joseph P.....'02–03 | 10 00 | |
| Hall, Lincoln G.....'02 | 5 00 | |
| Hall, William A.....'02 | 5 00 | |
| Hallberg, Carl S. N.....'02 | 5 00 | |
| Halstead, Alice L.....'02–'03 | 10 00 | |
| Hamilton, William C.....'02–03 | 10 00 | |
| Hammar, Alrik.....'03 | 5 00 | |
| Hance, Anthony M.....'02 | 5 00 | 7 50 |
| Hancock, Charles W.....'03 | 5 00 | |
| Hankey, William T.....'02–'03 | 10 00 | |
| Harbaugh, Duncan J....'02–'03 | 10 00 | 5 00 |
| Hardin, John H.....'00–01–'02 | 15 00 | |
| Harper Robert N.....'02 | 5 00 | |
| Harrison, Richard H. M ....'00 | 5 00 | |
| Harrison, Robert L.....'01–'02 | 10 00 | |
| Harrison, William J.....'03 | 5 00 | |
| Hart, Joseph..... ...'02 | 5 00 | |
| Hartigan, Joseph D.....'02–'03 | 10 00 | 5 00 |
| Harting, Rudolph R.....'02 | 5 00 | |
| Hartwig, Otto J.....'02 | 5 00 | |
| Hartz, J. D. August.....'02–'03 | 10 00 | |
| Hassebrock, Henry F.....'02 | 5 00 | |
| Hassinger, Samuel E. R.....'03 | 5 00 | |
| Hatcher, Robert A.....'02 | 5 00 | |
| Hauenstein, William .....'03 | 5 00 | |
| Haussmann, Fred'k W.....'02 | 5 00 | |
| Havenhill, L. D..... ....'03 | 5 00 | |
| Hay, Edward A.....'03 | 5 00 | |
| Haydock, Mabelle.....'02 | 5 00 | |
| Hayes, Horace P.....'03 | 5 00 | |
| Haynes, David O .....'03 | 5 00 | |
| Hays, Francis B.....'02 | 5 00 | |
| Hazard, Elmer C.....'02 | 5 00 | |
| Hazlett, James L.....'03 | 5 00 | |
| Hechler, George L.....'03 | 5 00 | |
| Heebner, Charles F.....'02–'03 | 10 00 | |
| Heim, William J.....'02–'03 | 10 00 | |
| Heinitsh, Sigmund W....:...'03 | 5 00 | |
| Heinritz, Lebrecht G.....'02–'03 | 10 00 | |
| Helfman, Joseph....'01–'02–'03 | 15 00 | |
| Heiler, Charles T.....'01 | 5 00 | |
| Hemm, Francis..... .....'02 | 5 00 | |
| Hengst, J. Edwin .....'03 | 5 00 | |
| Henkel, Alice.....'07 | 5 00 | |
| Henkel, Charles B.....'02–'03 | 10 00 | |
| Henry, Charles.....'02 | 5 00 | |
| Henry, Charles L.....'02 | 5 00 | |
| Henry, Frank C.....'02 | 5 00 | |
| Hepburn, John.....'03 | 5 00 | |
| Herbst, William P.....'02 | 5 00 | |
| Amount carried forward..... | $2630 00 | $82 50 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward ..... | $2630 00 | $82 50 |
| Hereth, Frank S.....'03 | 5 00 | |
| Heydenreich, Emile .....'03 | 5 00 | |
| Hickerson, Wm. H.....'03 | 5 00 | |
| Hicks, Henry T.....'00–'01–'02 | 15 00 | |
| High, Raymond L.....'02 | 5 00 | |
| Hilton, Samuel L.....'02 | 5 00 | |
| Hinrichs, Gustavus D. .....'02 | 5 00 | |
| Hinton, Rufus G.....'02 | 5 00 | |
| Hiriart, Sebastian .....'02–03 | 10 00 | |
| Hitchcock, George H.....'02 | 5 00 | |
| Hoch, Aquila.....'03 | 5 00 | |
| Hoffman, George F.....'02 | 5 00 | |
| Hoffman, Herman .....'02 | 5 00 | |
| Hogan, John J.....'02 | 5 00 | |
| Hollander, Joseph M.....'03 | 5 00 | |
| Holiday, Francis E.....'02 | 5 00 | |
| Holmes, Henry E.....'02–'03 | 10 00 | |
| Holsendorf, Benjamin E. ....'02 | 5 00 | |
| Holt, Edwin M.....'02 | 5 00 | |
| Hood, Charles I. .....'03 | 5 00 | |
| Hood, Reuben C.....'02 | 5 00 | |
| Hope, Robert L..... 03 | 5 00 | |
| Hopkins, Jesse L.....'03 | 5 00 | |
| Hopkins, Zerah B.....'03 | 5 00 | |
| Hopp, Lewis C.....'02 | 5 00 | |
| Horn, Wilbur F.....'02 | 5 00 | |
| Horne, Warren W. .....'02–'03 | 10 00 | |
| Hover, William A.....'03 | 5 00 | |
| Howard, Fletcher.....'03 | 5 00 | |
| Howson, Arthur B.....'03 | 5 00 | |
| Huder, Henry J.....'02–'03 | 10 00 | |
| Hudnut, Richard A.....'03 | 5 00 | |
| Hudson, Arthur.....'02 | 5 00 | |
| Hughes, Francis S.....'02–'03 | 10 00 | |
| Huhn, George .....'03 | 5 00 | |
| Hummel, John A.....'03 | 5 00 | |
| Hurd, John C. ..... ...'03 | 5 00 | |
| Hurlebaus, George W..... '02 | 5 00 | |
| Hurty, John N. .....'03 | 5 00 | |
| Hynson, Henry P.....'03 | 5 00 | |
| Ilhardt, William K .....'02 | 5 00 | |
| Irvine, Darwin W.....'02 | 5 00 | |
| Jackman, Wilbur F.....'03 | 5 00 | |
| Jackson, Frank A.....'03 | 5 00 | |
| Jacobs, Charles C ..... '02–'03 | 10 00 | |
| Jelliffe, Smith E ..... .....'02 | 5 00 | |
| Joergensen, Sophus.....'03–'04 | 10 00 | |
| Johns, William G.....'02 | 5 00 | |
| Johnson, Charles B.....'02 | 5 00 | |
| Johnson, Ralph H.....'02 | 5 00 | |
| Jones, Alexander H. .....'03 | 5 00 | |
| Jones, Oscar W.....'02–'03 | 10 00 | |
| Jones, Simon N.....'02 | 5 00 | |
| Jorden, Henry A.....'02–'03 | 10 00 | |
| Jorgenson, Edward B.....'02 | 5 00 | |
| Jorgenson, Hans C.....'02 | 5 00 | |
| Judge, Charles R.....'02 | 5 00 | |
| Junger, William F. F.....'02 | 5 00 | 5 00 |
| Jungmann, Julius.....'02 | 5 00 | |
| Kalish, Julius.....'03 | 5 00 | 5 00 |
| Kalish, Oscar G.....'03 | 5 00 | |
| Keaney, James J.....'02 | 5 00 | |
| Keenan, Thomas J.....'02 | 5 00 | |
| Keeney, Caleb R. .....'03 | 5 00 | |
| Kennedy, Ezra J .....'02 | 5 00 | |
| Kephart, Philip.....'02–'03 | 10 00 | |
| Keppler, Christian L. ...'00–'01 | 10 00 | |
| Kerr, William W.....'00–'01 | 10 00 | |
| Kettler, Edward, Jr... .....'03 | 5 00 | |
| Kienth, Hans.....'03 | 5 00 | |
| Kilmer, Frederick B.....'03 | 5 00 | |
| King, Campbell T.....'02 | 5 00 | |
| King, Ferdinand H.....'02 | 5 00 | |
| King, George A. N.....'02–'03 | 10 00 | |
| King, Robert B.....'97–'98–'99 | 15 00 | |
| Amount carried forward ..... | $3090 00 | $92 50 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward. ..... | $3090 00 | $92 50 |
| Kinney, Charles N.....'02 | 5 00 | |
| Kirchgasser, William C.....'03 | 5 00 | |
| Kirk, James E. . ...'00–'01–'02 | 15 00 | |
| Klein, Ernest F..... .....'03 | 5 00 | |
| Klein, Frederick.....'01–'02 | 10 00 | |
| Klie, G. H. Charles .....'02 | 5 00 | |
| Kline, Clarence M. .... '02–'03 | 10 00 | |
| Kline, Mahlon N.....'03 | 5 00 | |
| Kloster, Benjamin J.....'02 | 5 00 | |
| Knabe, Gustavus A.....'02 | 5 00 | |
| Knoebel, Thomas.....'03 | 5 00 | |
| Knoefel, Bruno.....'03 | 5 00 | |
| Knoefel, Charles D.....'02–'03 | 10 00 | |
| Knox, James W. T.....'02–'03 | 10 00 | |
| Koch, Julius A.....'02 | 5 00 | |
| Koch, Louis .....'03 | 5 00 | |
| Koelle, Otto C.....'02–'03 | 10 00 | |
| Koeneke, Charles H.....'02 | 5 00 | |
| Kolb, William W.....'03 | 5 00 | |
| Kolsch, Julius.....'02–'03 | 10 00 | |
| Kornmann, Henry .....'02 | 5 00 | |
| Kosminsky, Leonce J.....'02 | 5 00 | |
| Kremers, Edward.....'03 | 5 00 | |
| Krewson, William E.....'99–'00 | 10 00 | |
| Krieger, Philip.....'02 | 5 00 | |
| Kuder, William F.....'03 | 5 00 | |
| Kuehne, Charles .....'02 | 5 00 | |
| La Pierre, Elie H.....'03 | 5 00 | |
| La Wall, Charles H.....'02 | 5 00 | |
| Lachance, Seraphin.....'01–'02 | 10 00 | |
| Laird, John.....'03 | 5 00 | |
| Lamar, Henry J.....'02 | 5 00 | |
| Lamar, William R.....'02 | 5 00 | |
| Lampa, Robert K. .....'01–'02 | 10 00 | |
| Land, Robert H., Jr.....'02 | 5 00 | |
| Lauricella, Felice.....'02 | 5 00 | |
| Le Richeux, Alfred C.....'02 | 5 00 | |
| Leedom, Charles .....'02 | 5 00 | |
| Legendre, Joseph.....'02 | 5 00 | |
| Lehr, Philip.....'02–'03 | 10 00 | |
| Lehritter, George P.....'02–'03 | 10 00 | |
| Leslie, William A.....'02 | 5 00 | |
| Leverty, John A.....'02–'03 | 10 00 | |
| Levy, William M.....'01–'02–'03 | 15 00 | |
| Lewis, Ernest G.....'02–'03 | 10 00 | |
| Lichthardt, George H. P..'02–'03 | 10 00 | 5 00 |
| Lillie, Foress B.....'02–'03 | 10 00 | |
| Lilly, Josiah H .. .....'03 | 5 00 | |
| Lindly, John M.....'03 | 5 00 | |
| Lindvall, Gus.....'03 | 5 00 | |
| Lo Sardo, Antonino .....'02 | 5 00 | |
| Loehr, Theodore C. .....'02 | 5 00 | |
| Lohmann, Her. J..'99–'00–'01–'02 | 20 00 | |
| Long, John P..... .....'02 | 5 00 | |
| Loomis, John C.....'02 | 5 00 | |
| Louis, Henry .....'02 | 5 00 | |
| Lovvorn, James L... ...'01–'02 | 10 00 | |
| Lowd, John C.....'03 | 5 00 | |
| Lowe, Clement B.....'02 | 5 00 | |
| Lowell, Edward M.....'03 | 5 00 | |
| Lueder, Fritz... .....'03 | 5 00 | |
| Lunney, William J.....'02 | 5 00 | |
| Luve, Frank A. A.....'02 | 5 00 | |
| Lyon, George C.....'03 | 5 00 | |
| Lyons, Albert B.....'02 | 5 00 | |
| Lyons, Isaac L ..... .....'03 | 5 00 | |
| MacFadden, Warren L...'02–'03 | 10 00 | |
| MacRae, John Y.....'01–'02 | 10 00 | |
| Mack, George C.....'02 | 5 00 | 5 00 |
| Macnair, Whitmel H.....'01–'02 | 10 00 | |
| Macy, Sherman R.....'02 | 5 00 | |
| Maguire, Edward S.....'03 | 5 00 | |
| Maisch, Henry .... .....'02–'03 | 10 00 | |
| Major, John R.....'02 | 5 00 | |
| Mansfield, Samuel.....'02–'03 | 10 00 | |
| Amount carried forward ..... | $3605 00 | $102 50 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward ..... | $360 5 00 | $102 50 |
| Mares, Ferdinand L. .....'03 | 5 00 | |
| Mares, Frank M.....'02 | 5 00 | |
| Mariamson, Max.....'02 | 5 00 | |
| Markoe, George B....'00–'01–'02 | 15 00 | |
| Marshall, Ernest C...'00–'01–'02 | 15 00 | |
| Martin, John C.....'02 | 5 00 | |
| Martin, Nicholas H. .....'03 | 5 00 | |
| Mason, Harry B. .....'02 | 5 00 | |
| Matthews, Charles E. .....'03 | 5 00 | |
| Matusow, Harry .....'03 | 5 00 | |
| May, Charles C. .....'02 | 5 00 | |
| May, Louis.....'03 | 5 00 | |
| Mayo, Caswell A.....'02–'03 | 10 00 | |
| McAdams, Harry K. .....'02 | 5 00 | |
| McConnell, Charles H. .....'03 | 5 00 | |
| McDonald, George .....'02 | 5 00 | |
| McElhenie, Thomas D.... ..'02 | 5 00 | |
| McGill, John T.....'03 | 5 00 | |
| McIntyre, Ewen .....'03 | 5 00 | |
| McIntyre, William . .....'03 | 5 00 | |
| McKenzie, Hugh H. .....'02 | 5 00 | |
| McKesson, John, Jr. .....'03 | 5 00 | |
| McKinney, Robert S. .....'02 | 5 00 | |
| McMahon, Joseph.....'03 | 5 00 | |
| McNair, John S. .....'02–'03 | 10 00 | |
| Meissner, Frederick W., Jr...'03 | 5 00 | |
| Menk, Charles W.....'02 | 5 00 | |
| Mentzer, Harvey H. ....'02–'03 | 10 00 | |
| Mercer, William E. .....'02–'03 | 10 00 | |
| Meredith, H. Lionel .....'03 | 5 00 | |
| Merrell, Charles G .....'03 | 5 00 | |
| Merrell, George .....'03 | 5 00 | |
| Merrell, George R.....'02 | 5 00 | |
| Merrem, Charles D. .....'02 | 5 00 | |
| Metzger, Matthias C. ....'02–'03 | 10 00 | |
| Meyer, Theodore F.....'02 | 5 00 | |
| Michaelis, Gustavus.....'03 | 5 00 | |
| Michels, Victor C.....'02 | 5 00 | |
| Millard, David R.....'03 | 5 00 | |
| Miller, Charles.....'02 | 5 00 | |
| Miller, Emerson R.....'02 | 5 00 | |
| Miller, Frederick J.....'02–'03 | 10 00 | |
| Miller, Frederick W. .....'02 | 5 00 | |
| Miller, Herman .....'02 | 5 00 | |
| Miller, Jacob A. .....'02 | 5 00 | |
| Miller, T. Ashby.....'03 | 5 00 | |
| Milligan, Decatur .....'03 | 5 00 | |
| Milligan, John D. .....'02–'03 | 10 00 | |
| Milliken, John T. .....'02 | 5 00 | |
| Miner, Maurice A.....'02 | 5 00 | |
| Minnick, William G. .....'02 | 5 00 | |
| Mittelbach, William .....'03 | 5 00 | |
| Moerk, Frank X.....'03 | 5 00 | |
| Monaghan, Thomas F....'02–'03 | 10 00 | 5 00 |
| Moore, Silas H. .....'02 | 5 00 | |
| Morgan, Aylmer L. .....'03 | 5 00 | |
| Morgan, Charles .....'02 | 5 00 | |
| Morison, J. Louis D.....'02 | 5 00 | |
| Morris, George A.....'02 | 5 00 | |
| Morris, Henry M.....'02 | 5 00 | |
| Morris, Max .....'02 | 5 00 | |
| Morrison, William W. .....'02 | 5 00 | |
| Morse, Edward W. .....'02–'03 | 10 00 | |
| Morse, Frank D. .....'02–'03 | 10 00 | 5 00 |
| Mosher, William W.....'03 | 5 00 | |
| Mueller, Adolphus .....'03 | 5 00 | |
| Muench, William.....'03 | 5 00 | |
| Mulford, Henry K.....'03 | 5 00 | |
| Mumma, Edgar .....'02 | 5 00 | |
| Murphy, John S.....'02 | 5 00 | |
| Muth, George L.....'03 | 5 00 | |
| Muth, John C. .....'03 | 5 00 | |
| Muth, John S. .....'03 | 5 00 | |
| Mutty, Walter C. .....'02 | 5 00 | |
| Myers, Daniel .....'03 | 5 00 | |
| Amount carried forward..... | $405 0 00 | $112 50 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward ..... | $405 0 00 | $112 50 |
| Myers, Preston B.....'02–'03 | 10 00 | |
| Nattans, Arthur.....'03 | 5 00 | |
| Neeley, Guy M.....'02 | 5 00 | |
| Nelson, Burt E. .....'02–'03 | 10 00 | |
| Nichols, John C.....'02 | 5 00 | |
| Nichols, Thomas B. .....'02 | 5 00 | |
| Nielsen, John.....'02 | 5 00 | |
| Nixon, Charles F.....'03 | 5 00 | |
| Noll, Matthias .....'03 | 5 00 | |
| Norton, George E. .....'03 | 5 00 | |
| O'Gorman, Theophilus V. ...'03 | 5 00 | |
| O'Hare, James.....'03 | 5 00 | |
| O'Neil, Henry M.....'03 | 5 00 | |
| Oetinger, Albert .....'02–'03 | 10 00 | 5 00 |
| Ogier, John M. .....'03 | 5 00 | |
| Oliver, William M. .....'03 | 5 00 | |
| Ortiz, Miguel A. ..... '02 | 5 00 | 5 00 |
| Orton, Ingomar F. .....'03 | 5 00 | |
| Osseward, Cornelius .....'02–'03 | 10 00 | |
| Oster, Frank C.....'02 | 5 00 | |
| Osterlund, Otto W. .....'02–'03 | 10 00 | 5 00 |
| Ottinger, James J. .....'03 | 5 00 | |
| Otto, Theodor G. E. .....'02–'03 | 10 00 | |
| Paddock, Morris V. .....'02 | 5 00 | |
| Palmer, J. Dabney .....'02–'03 | 10 00 | |
| Parisen, George W.....'00–'01 | 10 00 | |
| Parker, Frederick M. ....'02–'03 | 10 00 | |
| Parmalee, Walter W.....'02 | 5 00 | 5 00 |
| Parsons, Charles W. ....'00–'01 | 10 00 | |
| Partridge, Frank R. .....'02–'03 | 10 00 | |
| Patch, Edgar L. .....'03 | 5 00 | |
| Patten, Eustis . ... .....'02–'03 | 10 00 | |
| Patton, John F. ..... .....'03 | 5 00 | |
| Pauley, Frank C.....'02 | 5 00 | |
| Payne, George F.....'02–'03 | 10 00 | |
| Peacock, Bertha L. .....'03 | 5 00 | |
| Peacock, Josiah C. .....'03 | 5 00 | |
| Pearson, Joseph F. .....'01–'02 | 10 00 | |
| Pease, Autumn V. .....'02–'03 | 10 00 | |
| Peck, George L. .....'03 | 5 00 | |
| Perkins, Benjamin A. .....'02 | 5 00 | |
| Perkins, C. William .....'02 | 5 00 | |
| Perry, Frederick W. R.....'02 | 5 00 | |
| Peterson, John N. ..... '02 | 5 00 | |
| Petsche, Bismark Wm. .....'02 | 5 00 | |
| Pfaff, Franz.....'03 | 5 00 | |
| Philibert, Leon D.....'02 | 5 00 | |
| Phillips, Carrie E.....'02–'03 | 10 00 | |
| Pierce, William H. .....'03 | 5 00 | |
| Pile, Gustavus .....'02 | 5 00 | |
| Pilson, Abram O. .....'03 | 5 00 | |
| Pine, Warren C.....'00–'01–'02 | 15 00 | |
| Pippert, Nicholas J. .....'02 | 5 00 | |
| Pitt, John R. ..... .....'03 | 5 00 | |
| Placak, Harry .... .....'02–'03 | 10 00 | |
| Plaut, Albert.....'03 | 5 00 | |
| Poole, William E. .....'02 | 5 00 | |
| Porter, Chilton S. .....'02–'03 | 10 00 | |
| Potts, David G. ..... .....'03 | 5 00 | |
| Powell, William C.....'02 | 5 00 | |
| Powell, William D. ..'00–'01–'02 | 15 00 | |
| Prall, Delbert E. .....'02–'03 | 10 00 | |
| Preissler, Henry W.....'02 | 5 00 | |
| Price, Charles H. .....'03 | 5 00 | |
| Price, Joseph .....'03 | 5 00 | |
| Pringle, James M. .....'02 | 5 00 | |
| Punch, William F. .....'00 | 5 00 | |
| Pursel, Robert C. .....'02 | 5 00 | |
| Quackinbush, Benjamin F. ..'03 | 5 00 | |
| Quandt, Arthur A. .....'02–'03 | 10 00 | |
| Quandt, Ernest E. .....'02–'03 | 10 00 | |
| Quigley, Richard L. .....'02 | 5 00 | |
| Quin, Frank W. .....'02 | 5 00 | |
| Raeuber, Edward G. .....'03 | 5 00 | |
| Rains, A. Brown.....'02 | 5 00 | |
| Amount carried forward ..... | $455 0 00 | $132 50 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward ..... | $4550 00 | $132 50 |
| Ramaley, Francis ..... '03 | 5 00 | |
| Ramsaur, David W ..... '02 | 5 00 | |
| Rand, Daniel M ..... '02 | 5 00 | |
| Rapelye, Charles A ..... '02 | 5 00 | |
| Raubenheimer, Otto ....'02–'03 | 10 00 | 5 00 |
| Rauschenberg, Sidney..... '02 | 5 00 | |
| Reade, Frank M ..... '02 | 5 00 | |
| Redsecker, Jacob H .....'02–'03 | 10 00 | |
| Reed, Willoughby H ...'03–'04 | 10 00 | |
| Reeves, Sidney H ..... '02 | 5 00 | |
| Reilly, Robert C ..... '02 | 5 00 | |
| Reimann, George ..... '02 | 5 00 | |
| Renshaw, Thomas W..... '02 | 5 00 | |
| Reynolds, Charles E ..... '03 | 5 00 | |
| Reynolds, John J ..... '02 | 5 00 | |
| Rhode, Rudolph E ..... '03 | 5 00 | |
| Rhodes, Charles O..... '02–'03 | 10 00 | |
| Rich, W. Pitt... ..... '02–'03 | 10 00 | |
| Richardson, Edwin S..... '02 | 5 00 | |
| Richardson, Horatio S..... '03 | 5 00 | |
| Richardson, Willard S..... '02 | 5 00 | |
| Riddell, Benjamin F..... '03 | 5 00 | |
| Ridgway, William F.....'02–'03 | 10 00 | |
| Riley, Russell ..... ..... '02 | 5 00 | |
| Robinson, Wm. J. M ....'02–'03 | 10 00 | |
| Rockefeller, Howard.....'02–'03 | 10 00 | |
| Rockefeller, Lucius ..... '03 | 5 00 | |
| Rodemoyer, William E.....'03 | 5 00 | |
| Roe, J. Newton.....'02–'03 | 10 00 | 7 50 |
| Roe, William G..... '02 | 5 00 | |
| Roehrig, Albert M.....'02–'03 | 10 00 | |
| Roeller, Edward F.....'02–'03 | 10 00 | |
| Roesch, Anton..... ..... '02 | 5 00 | |
| Rogers, Anthony C..... '02 | 5 00 | |
| Rogers, Arthur H..... '02 | 5 00 | |
| Rogers, Edward..... '02 | 5 00 | |
| Rogers, William H..... '03 | 5 00 | |
| Root, Wilfred F..... '02 | 5 00 | |
| Rose, Herman L..... '03 | 5 00 | |
| Rosengarten, George D..'02–'03 | 10 00 | |
| Rosenham, Charles J.. .....'02 | 5 00 | |
| Rosenthal, David A ..... '03 | 5 00 | |
| Rosenzweig, Benjamin.....'03 | 5 00 | |
| Roth, Charles R ..... '02 | 5 00 | |
| Rowlinski, Robert A ..... '02 | 5 00 | |
| Ruenzel, Henry G ..... '03 | 5 00 | |
| Ruhl, Harry F ..... '02–'03 | 10 00 | |
| Ruppert, John ..... '02 | 5 00 | |
| Ryan, Frank G ..... '03 | 5 00 | |
| Sadtler, Samuel P . ..... '03 | 5 00 | |
| Samson, Max ..... ...'03 | 5 00 | |
| Sanford, John F ..... '02 | 5 00 | |
| Sauerhering, Rudolph A.....'02 | 5 00 | |
| Sauvinet, Charles D .....'02–'03 | 10 00 | |
| Sawyer, Charles H ..... '03 | 5 00 | |
| Sayre, Edward A..... '03 | 5 00 | |
| Sayre, William H ..... '02 | 5 00 | |
| Schafer, George H ..... .'02 | 5 00 | |
| Schafhirt, Adolph J. ..... '02 | 5 00 | |
| Scherer, Andrew ..... .....'03 | 5 00 | |
| Scherling, Gustav .....'02–'03 | 10 00 | |
| Schieffelin, William J.....'03 | 5 00 | |
| Schimpf, Henry W..... '03 | 5 00 | |
| Schleussner, Chas. F.....'02–'03 | 10 00 | |
| Schlosser, Peter..... '02 | 5 00 | |
| Schlotterbeck, Augustus G...'03 | 5 00 | |
| Schlotterbeck, Julius O ..'02–'03 | 10 00 | |
| Schmidt, Charles..... '02 | 5 00 | |
| Schmidt, Ferdinand T .....'02 | 5 00 | |
| Schmidt, Frederick M .....'03 | 5 00 | |
| Schmidt, Joseph H..... '02 | 5 00 | |
| Schmidt, Valentine..... '02 | 5 00 | |
| Schmitt, George J. F..... '03 | 5 00 | |
| Schmitter, Jonathan..... '02 | 5 00 | |
| Schoenhut, Christie H..... '03 | 5 00 | |
| Amount carried forward..... | $5010 00 | $145 00 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward ..... | $5010 00 | $145 00 |
| Schoenthaler, John P..... '02 | 5 00 | |
| Schrader, August C ..... '03 | 5 00 | |
| Schrank, C. Henry..... '03 | 5 00 | |
| Schreiber, August..... '02 | 5 00 | |
| Schuh, Paul G ..... '03 | 5 00 | |
| Schumann, Otto G .....'02–'03 | 10 00 | |
| Schulze, Louis ..... '02 | 5 00 | |
| Schutz, Chris..... '02 | 5 00 | |
| Scott, George T..... '02 | 5 00 | |
| Scott, William H ..... '03 | 5 00 | |
| Scoville, Wilbur L ..... '03 | 5 00 | |
| Seaverns, Martha G.....'02–'03 | 10 00 | |
| Seidel, John H..... '02 | 5 00 | |
| Seinsoth, John J..... '02 | 5 00 | |
| Seitz, Lorenz A ..... '02 | 5 00 | |
| Selzer, Eugene R..... '03 | 5 00 | |
| Sennewald, Emil A ..... '02 | 5 00 | |
| Serodino, Herman..... '03 | 5 00 | |
| Shafer, Erwin C..... '03 | 5 00 | |
| Sharp, Sol A..... ..... '02 | 5 00 | |
| Shendal, Ernest E..... '02 | 5 00 | |
| Sherman, Charles R..... '03 | 5 00 | |
| Sherwood, Henry J..... '03 | 5 00 | |
| Shoemaker, Clayton F...'02–'03 | 10 00 | |
| Shoults, Robert G..... '03 | 5 00 | 5 00 |
| Shrader, William E..... '02 | 5 00 | |
| Shreve, John A..... ...'02–'03 | 10 00 | |
| Siegenthaler, Harvey N..'02–'03 | 10 00 | |
| Sieker, Ferdinand A..... '03 | 5 00 | |
| Silverburg, Victor E..... ...'02 | 5 00 | |
| Simon, William ..... '03 | 5 00 | |
| Simson, Francis C .....'02–'03 | 10 00 | |
| Skelly, James J ..... .....'02 | 5 00 | |
| Slade, Harry A ..... '03 | 5 00 | |
| Slater, Frank H..... '02 | 5 00 | |
| Smith, Albert H.....'02–'03 | 10 00 | |
| Smith, Charles B..... '02 | 5 00 | |
| Smith, Clarence P..... '02 | 5 00 | |
| Smith, Edward N..... ....'02 | 5 00 | |
| Smith, Edward W ..... '02 | 5 00 | |
| Smith, Francis M..... '02 | 5 00 | |
| Smith, James A ..... '02 | 5 00 | |
| Smith, Lauriston S..... '03 | 5 00 | |
| Smith, Linville H .....'02–'03 | 10 00 | |
| Smith, Theodric..... '02 | 5 00 | |
| Smith, Walter V..... ....'02–'03 | 10 00 | |
| Smith, White G.....'00–'01–'02 | 15 00 | |
| Smith, Willard A..... '03 | 5 00 | |
| Smithson, David E..... '03 | 5 00 | |
| Sniteman, Charles C..'01–'02–'03 | 15 00 | |
| Snodgrass, Latta K..... '03 | 5 00 | |
| Snow, Charles W..... '03 | 5 00 | |
| Sohrbeck, G. Henry ..... '03 | 5 00 | |
| Sohrbeck, George W..... '03 | 5 00 | |
| Solomons, Isaiah A..... ....'03 | 5 00 | |
| Sords, Thomas V..... '03 | 5 00 | |
| Spalding, Warren A..... '03 | 5 00 | |
| Spangler, Lewis C. .....'02–'03 | 10 00 | |
| Speer, Charles C.....'02–'03 | 10 00 | |
| Speissegger, Walter L....'02–'03 | 10 00 | |
| Sprague, Wesson G ..... '03 | 5 00 | |
| Sprissler, Clara.....'02–'03 | 10 00 | |
| Squibb, Charles F..... '03 | 5 00 | |
| Squibb, Edward H..... '03 | 5 00 | |
| St. John, Sydney S..... '03 | 5 00 | |
| Staehle, Louis L..... .....'02 | 5 00 | |
| Stahlhuth, Ernst H. W.....'02 | 5 00 | |
| Stamford, William H..... '02 | 5 00 | |
| Stange, Carl F..... '02 | 5 00 | |
| Staudt, Louis C .....'02–'03 | 10 00 | |
| Stearns, Frederick ..... '03 | 5 00 | |
| Stecher, Frederick W.....'02 | 5 00 | |
| Stein, Edward T. N.....'02–'03 | 10 00 | |
| Stein, Jacob H ..... '02 | 5 00 | |
| Steinmeyer, William O .....'03 | 5 00 | |
| Amount carried forward..... | $5480 00 | $150 00 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward..... | $5480 00 | $155 00 |
| Stephenson, Charles W.....'02 | 5 00 | |
| Stevens, Alviso B.....'02 | 5 00 | |
| Stewart, Aaron W.....'02 | 5 00 | |
| Stewart, Francis E..... .....'02 | 5 00 | |
| Stier, Carl.....'02–'03 | 10 00 | 5 00 |
| Stone, Clarence G.....'03 | 5 00 | |
| Stormes, John E.....'02–'03 | 10 00 | |
| Stott, Samuel T..... .....'02 | 5 00 | |
| Stoughton, Dwight G.....'02 | 5 00 | |
| Stowell, Daniel.....'02 | 5 00 | |
| Street, Edmund O.....'01–'02 | 10 00 | |
| Stroup, Freeman P.....'03 | 5 00 | |
| Stuart, William A.....'02 | 5 00 | |
| Sturmer, Julius W.....'02–'03 | 10 00 | |
| Stutzlen, Frank C.....'02–'03 | 10 00 | |
| Sultan, Frederick W.....'02 | 5 00 | |
| Swain, Harry.....'02–'03 | 10 00 | |
| Swannell, Henry.....'02 | 5 00 | |
| Sweet, Caldwell.....'03 | 5 00 | |
| Takamine, Jokichi.....'02–'03 | 10 00 | |
| Taylor, Augustus C.....'02 | 5 00 | |
| Taylor, George E.....'03 | 5 00 | |
| Taylor, Mallory H.....'02 | 5 00 | |
| Teeters, Wilbur J.....'02–'03 | 10 00 | |
| Temm, William D. .....'02 | 5 00 | |
| Terrill, Willis E.....'00–'01 | 10 00 | |
| Thames, Joseph J.....'02–'03 | 10 00 | |
| Thelander, Chreston C.....'02 | 5 00 | |
| Thomas, Frank W.....'02 | 5 00 | |
| Thomas, Oscar E.....'00 | 5 00 | |
| Thomas, Robert, Jr.....'03 | 5 00 | |
| Thomasson, Anders.....'03 | 5 00 | |
| Thompson, Albert D..'00–'01–'02 | 15 00 | |
| Thompson, Edwin T.....'02 | 5 00 | 7 50 |
| Thompson, Joseph.....'02–'03 | 10 00 | 7 50 |
| Thorburn, Albert D.....'02 | 5 00 | |
| Thorn, Henry P..... .....'03 | 5 00 | |
| Thurston, Azor.....'02–'03 | 10 00 | |
| Tidball, James T..... '02 | 5 00 | |
| Timberlake, Arthur.....'02 | 5 00 | |
| Tobin, John M.....'02 | 5 00 | |
| Todd, Albert M.....'03 | 5 00 | |
| Torbert, Willard H.....'03 | 5 00 | |
| Traynor, Charles F.....'02 | 5 00 | |
| Treat, Joseph A.....'03 | 5 00 | |
| Troxel, Henry L.....'02 | 5 00 | |
| Troxler, Robert F.....'02 | 5 00 | |
| Truax, Charles .....'02–'03 | 10 00 | |
| Tucker, Greenleaf R.....'02–'03 | 10 00 | |
| Turner, Adam.....'02 | 5 00 | |
| Turner, George H.....'01 | 5 00 | |
| Turnquist, Carl M.....'03 | 5 00 | |
| Tuthill, Frederic P.....'02–'03 | 10 00 | |
| Uhlich, Ferdinand G.....'02 | 5 00 | |
| Van Winkle, Abraham.....'02 | 5 00 | |
| Vanderkleed, Charles E.....'02 | 5 00 | |
| Vargas, Jorge..... ..'02–'03 | 10 00 | |
| Vaughan, Parry W.....'01–'02 | 10 00 | |
| Viallon, Paul L., Jr.....'02 | 5 00 | |
| Vitt, Rudolph S.....'02 | 5 00 | |
| Voight, Joseph F.....'03 | 5 00 | |
| Vordick, August H.....'02 | 5 00 | |
| Voss, George W.....'03 | 5 00 | |
| Waddell, Minor T.....'03 | 5 00 | |
| Walbridge, Cyrus P.....'02 | 5 00 | |
| Waldner, Paul J.....'01–'02 | 10 00 | |
| Walker, E. Edward.....'01–'02 | 10 00 | |
| Walker, John P. .....'03 | 5 00 | |
| Walker, William J. .....'03 | 5 00 | |
| Wall, Otto A.....'02 | 5 00 | |
| Walter, Charles A.....'03 | 5 00 | |
| Amount carried forward.. .... | $5940 00 | $175 00 |

| | Annual Dues. | Certificates. |
|---|---|---|
| Amount brought forward..... | $5940 00 | $175 00 |
| Wangler, Conrad D.....'03 | 5 00 | |
| Wanous, Josie A.....'02–'03 | 10 00 | |
| Ward, A. Jae .....'03 | 5 00 | |
| Ward, Charles A.....'02 | 5 00 | |
| Ward, Homer B..... .....'02 | 5 00 | |
| Ware, Charles H..... .....'02 | 5 00 | |
| Warn, William E.....'03 | 5 00 | |
| Warner, William R., Jr..'02–'03 | 10 00 | 7 50 |
| Warren, William M.....'02 | 5 00 | |
| Watson, Herbert K.....'02–'03 | 10 00 | |
| Watson, Sidney P.. .....'02–'03 | 10 00 | |
| Watson, William, Jr.....'02 | 5 00 | |
| Watt, George H.....'02 | 5 00 | |
| Weakley, William S.....'02 | 5 00 | |
| Weaver, Francis M..... ...'02 | 5 00 | |
| Webber, J. LeRoy .....'03 | 5 00 | |
| Weber, Peter J.....'02 | 5 00 | |
| Weidemann, Charles A.....'03 | 5 00 | |
| Weidemann, George B...'02–'03 | 10 00 | 5 00 |
| Weiser, William P.....'02 | 5 00 | |
| Weiss, Conrad H.....'02 | 5 00 | |
| Weller, Frank P.....'02 | 5 00 | |
| Wendel, H. Edward.....'03 | 5 00 | |
| Wenzell, William T..... ...'03 | 5 00 | |
| Werner, Rudolph C..'01–'02–'03 | 15 00 | |
| Wescott, William C .....'02 | 5 00 | |
| Wesner, Henry C.....'03 | 5 00 | |
| West, Courtney H.....'02 | 5 00 | |
| Wetterstroem, Albert .....'02 | 5 00 | |
| Wetterstroem, Theodore D...'03 | 5 00 | |
| Wheeler, William D.....'02–'03 | 10 00 | |
| Whipple, George H. .....'02–'03 | 10 00 | |
| Whitcomb, Frederick E.....'02 | 5 00 | |
| White, Charles H.....'02–'03 | 10 00 | |
| Whitehead, Eugene T..... '02 | 5 00 | |
| Whitney, Edgar F. .....'03 | 5 00 | |
| Wickham, William H.....'03 | 5 00 | |
| Wikle, Jesse L.....'02–'03 | 10 00 | |
| Wilbert, Martin I.....'02–'03 | 10 00 | |
| Wilbur, Lot..... .....'03 | 5 00 | |
| Wiley, Harvey W..... .....'02 | 5 00 | |
| Willard, Rowland.....'02–'03 | 10 00 | |
| Williams, John K.....'02 | 5 00 | |
| Williams, Morrison P.....'02 | 5 00 | |
| Williams, Richard W.....'03 | 5 00 | |
| Williams, Seward W.. ...'02–'03 | 10 00 | |
| Willis, Henry.....'02–'03 | 10 00 | |
| Wilson, Oscar H.....'02 | 5 00 | |
| Wisdom, Hugh .....'02 | 5 00 | |
| Witting, Frederick F.....'02–'03 | 10 00 | |
| Wittmer, Joseph W., Jr. ....'03 | 5 00 | |
| Wolcott, Frank E.....'02–'03 | 10 00 | |
| Wolf, Henry A.....'02 | 5 00 | |
| Wolff, Edward H.....'02 | 5 00 | |
| Wood, Alonzo F., Jr.....'03 | 5 00 | |
| Wood, Edward S.....'03 | 5 00 | |
| Wood, James P.....'03 | 5 00 | |
| Wood, John W.....'03 | 5 00 | |
| Woodman, Walter I.....'03 | 5 00 | |
| Woodruff, Roderick S.....'99 | 5 00 | |
| Woods, Charles H. A....'02–'03 | 10 00 | |
| Wooten, Thomas V.....'02–'03 | 10 00 | |
| Wrensch, Henry E., Jr..'02–'03 | 10 00 | |
| Wright, Charles L.....'02 | 5 00 | |
| Wuensch, Charles..... .'02 | 5 00 | |
| Wunderlich, Edward.....'02 | 5 00 | |
| Wurmb, Theodore H.....'02 | 5 00 | |
| Young, Charles.....'02–'03 | 10 00 | |
| Zabaldano, Alexander .....'02 | 5 00 | |
| Zuenkeler, J. Ferd.....'03 | 5 00 | |
| Zwick, Karl G.....'03 | 5 00 | |
| Totals..... ... | $6400 00 | $182 50 |

# LIST OF COLLEGES AND ASSOCIATIONS.

HAVING ACCREDITED DELEGATES TO THE FIFTY-FIRST ANNUAL MEETING, HELD AT MACKINAC ISLAND, MICH., WITH THE NAMES OF THEIR PRESIDENTS AND SECRETARIES.

## COLLEGES OF PHARMACY.

| *Name.* | *President.* | *Secretary.* |
|---|---|---|
| Albany | Wm. J. Walker | Theo. J. Bradley. |
| Atlanta | Howard Van Epps | Geo. F. Payne. |
| California | Gaston E. Bacon | Wm. M. Searby. |
| Chicago | A. S. Draper | W. B. Day. |
| Cleveland | E. A. Schellentrager | Joseph Feil. |
| Highland Park | O. H. Longwell | S. R. Macy. |
| Maryland | Chas. E. Dohme | Chas. H. Ware. |
| Massachusetts | Wm. D. Wheeler | Geo. E. Coleman. |
| National | Henry E. Kalusowski | W. H. Bradbury. |
| New York | Chas. F. Chandler | Thos. F. Main. |
| Philadelphia | Howard B. French | C. A. Weidemann. |
| Pittsburg | Louis Emanuel | H. L. Lohmyer. |
| St. Louis | Theo. F. Hagenow | J. C. Falk. |

## SCHOOLS OF PHARMACY.

| | | |
|---|---|---|
| Illinois Medical College | Chicago, Ill. | N. H. Adams, *Dean.* |
| Medico-Chirurgical College | Philadelphia, Pa. | Jas. R. Calhoun, *Dean.* |
| Northwestern University | Chicago, Ill. | Oscar Oldberg, *Dean.* |
| Purdue University | Lafayette, Ind. | Arthur Green, *Dean.* |
| University of Iowa | Iowa City, Ia. | E. L. Boerner, *Dean.* |
| University of Michigan | Ann Arbor, Mich. | A. B. Prescott, *Dean.* |
| University of Minnesota | Minneapolis, Minn. | F. J. Wulling, *Dean.* |
| Vanderbilt University | Nashville, Tenn. | J. T. McGill, *Dean.* |

## ALUMNI ASSOCIATIONS OF COLLEGES OF PHARMACY.

| *Name.* | *President.* | *Secretary.* |
|---|---|---|
| Northwestern University | H. Kahn | E. Scott. |
| Philadelphia | Albert Oetinger | W. E. Krewson. |
| St. Louis | E. H. Voepel | A. R. Scheu. |

## STATE PHARMACEUTICAL ASSOCIATIONS.

| *Name.* | *President.* | *Secretary.* |
|---|---|---|
| Arkansas | R. B. King | Will. C. Bond. |
| Connecticut | J. A. Leverty | C. A. Rapelye. |
| Georgia | C. D. Jordan | J. B. Riley. |
| Indiana | M. A. Stout | A. Timberlake. |
| Iowa | Dell J. Morgan | Fletcher Howard. |
| Kansas | G. Gehring | E. E. Lair. |
| Maine | D. P. Moulton | M. L. Porter. |
| Maryland | J. W. Foster | Owen C. Smith. |
| Massachusetts | L. G. Heinritz | J. F. Guerin. |
| Michigan | D. A. Hagans | W. H. Burke. |
| Minnesota | A. J. Eckstein | Theo. F. Leeb. |
| Missouri | C. L. Wright | H. M. Whelpley. |
| Nebraska | C. E. Hopping | O. P. Baumann. |
| New Hampshire | Herbert E. Rice | J. H. Marshall. |
| New Jersey | Geo. S. Campbell | F. C. Stutzlen. |
| New York | Wm. C. Anderson | E. S. Dawson. |
| Ohio | Lewis C. Hopp | Theo. D. Wetterstroem. |
| Oklahoma | J. F. Seyforth | F. M. Weaver. |
| Pennsylvania | Wm. O. Frailey | J. A. Miller. |
| South Carolina | J. C. Mace | F. M. Smith. |
| South Dakota | C. W. Peaslee | E. C. Bent. |
| Texas | J. J. Thames | R. H. Walker. |
| Wisconsin | W. H. Barr | Henry Rollmann. |

## NATIONAL ASSOCIATIONS.

| *Name.* | *President.* | *Secretary.* |
|---|---|---|
| Retail Druggists | R. K. Smithers | T. V. Wooten. |
| Wholesale Druggists | W. A. Hover | J. E. Toms. |
| Woman's Pharmaceutical | Nina Piper | Charlotte Stimson. |

## LOCAL ASSOCIATIONS.

| *Name.* | *President.* | *Secretary.* |
|---|---|---|
| Dauphin Co., Pa. | G. A. Gorgas | Wm. Kullartz. |
| German Apothecaries Society of New York | Henry Imhof | Sidney Faber. |
| Kings County Pharm. Society | O. C. Kleine, Jr. | F. P. Tuthill. |
| Philadelphia Retail Druggists | Chas. Leedom | D. J. Reese. |

## GOVERNMENT SERVICE.

United States Navy.
Department of Agriculture.
U. S. Public Health and Marine Hospital Service.

# LIST OF MEMBERS AND DELEGATES IN ATTENDANCE AT MACKINAC ISLAND, MICH.

Names of delegates indicated by *; delegates not members by *†.

* Allison, W. O., New York, N. Y.
* Alpers, W. C., New York, N. Y.
* Anderson, W. C., Brooklyn, N. Y.
* Baird, J. W., Boston, Mass.
Bartells, Geo. C., Camp Point.
* Base, Daniel, Baltimore, Md.
Beal, J. H., Scio, O.
Benfield, C. W., Cleveland, O.
Beringer, Geo. M., Camden, N. J.
Bethea, O. W., Meriden, Miss.
* Boring, E. M., Philadelphia, Pa.
* Breunert, A., Kansas City, Mo.
Burke, W. H., Detroit, Mich.
* Caspari, Chas., Jr., Baltimore, Md.
* Claus, O. F., St. Louis, Mo.
* Cliffe, W. L., Philadelphia, Pa.
* Cook, T. P., New York, N. Y.
Daggett, V. C., New York, N. Y.
Darby, E. F., Harrow, Can.
D'Avignon, J. E., Windsor, Can.
* Dewoody, W. L., Pine Bluff, Ark.
Diehl, C. L., Louisville, Ky.
* Dohme, C. E., Baltimore, Md.
Dulaney, Jos., McKinney, Tex.
Dunn, J. A., Brooklyn, N. Y.
Eaton, H. E., Essex, Ia.
* Eberle, E. G., Dallas, Tex.
* Eberle, H. T., Watertown, Wis.
* Ebert, A. E., Chicago, Ill.
* Eliel, Leo, South Bend, Ind.
Englehard, Geo. P., Chicago, Ill.
Fennel, C. P. T., Cincinnati, O.
* Fisk, F. E., Chicago, Ill.
* Flemer, L., Washington. D. C.
* Forsyth, W. K., Chicago, Ill.
Gable, R. B., New York, N. Y.
* Gahn, Henry, New York, N. Y.
Gane, E. H., New York, N. Y.
Geisler, J. F., New York, N. Y.
*† Gilbert, R. B., Greensville, Ga.
* Good, J. M., St. Louis, Mo.
* Gordin, H. M., Chicago, Ill.
* Gordon, F. T., Washington, D. C.
* Gordon, Jean (Miss), Chicago, Ill.
* Gorgas, Geo. A., Harrisburg, Pa.
* Gray, M. M., Chicago, Ill.
Gundrum, Geo., Ionia, Mich.
Haake, Wm. H., Cleveland, O.
Hagans, D. O., Monroe, Mich.
Hall, Wm. A., Detroit, Mich.
* Hallberg, C. S. N., Chicago, Ill.
Hancock, C. W., Langborne, Pa.
Hankey, W. T., Cleveland, O.
Hassebrock, H. F., St. Louis, Mo.
Hauenstein, Wm., New York, N. Y.
Helfman, Jos., Detroit, Mich.
* Hengst, J. E., Baltimore, Md.
Hoch, A., Philadelphia, Pa.
* Holzhauer, C., Newark, N. J.
* Hopp, L. C., Cleveland, O.
Houghton, E. M., Detroit, Mich.
* Howard, Fletcher, Des Moines, Ia.
* Jones, D. F., Watertown, S. D.
Jones, P. M., San Francisco, Cal.
* Kahn, Harry, Chicago, Ill.
* Kebler, Lyman F., Washington, D. C.
Kennedy, E. J., New York, N. Y.
Kephart, P., Berrien Springs, Mich.
* Kettler, Ed., Jr., Milwaukee, Wis.
* King, F. H., Delphos. O.
* King, R. B., Helena, Ark.
* Kirchgessner, W. C., Grand Rapids, Mich.
*† Kirkpatrick, A. J., Oklahoma City, O. T.
Kleinschmidt, A. A., St. Louis, Mo.
Knox, J. W. T., Detroit, Mich.
* Koch, J. H., Pittsburg, Pa.
* Kremers., Edw., Madison, Wis.
Lampa, R. R., New York, N. Y.
Lilly, J. H., Indianapolis, Ind.
Loehr, Theo. C., Carlinsville, Ill.

* Lowe, C. B., Philadelphia, Pa.
Lyons, A. B., Detroit, Mich.
* Macy, S. R., Des Moines, Ia.
Mason, H. B., Detroit, Mich.
* Mayo, C. A., New York, N. Y.
* McGill, J. T., Nashville, Tenn.
* McIntyre, Wm., Philadelphia, Pa.
* Meissner, F. W., Laporte, Ind.
Merrell, C. G., Cincinnati, O.
* Mittlebach, Wm., Boonville, Mo.
Morse, Ed. W., Mt. Vernon, Ill.
Myers, P. B., Omaha, Neb.
* Noll, Matthias, Atchinson, Kan.
Ogier, J. M., Cambridge, O.
Ohliger, Willard, Detroit, Mich.
* Oldberg, Oscar, Chicago, Ill.
O'Neil, H. M., New York, N. Y.
* Parisen, G. W., Perth Amboy, N. J.
Patton, J. F., York, Pa.
Payne, Geo. F., Atlanta, Ga.
Perry, F. W. R., Detroit, Mich.
* Pond, Raymond H., Chicago, Ill.
* Puckner, W. A., Chicago, Ill.
Reidy, M., Corunna, Me.
* Reilly, Robert C., St. Louis, Mo.
Reimann, Geo., Buffalo, N. Y.
* Remington, J. P., Philadelphia, Pa.
Remington, J. Percy, Brooklyn N. Y.
Riley, C. M., Alton, Ill.
* Roehrig, A. M., Stapleton, N. Y.
Roth, C. R., Canton, O.
* Rosenzweig, B., Brooklyn, N. Y.
* Ruddiman, E. A., Nashville, Tenn.
* Rusby, H. H., New York, N. Y.
Ryan, F. G., Detroit, Mich.
* Sayre, E. A., New York, N. Y.
* Sayre, L. E., Lawrence, Kan.
Scherer, A., Chicago, Ill.
* Schlotterbeck, J. O., Ann Arbor, Mich.
* Schoults, R. G., Sonoma, Cal.
Schuh, P. G., Cairo, Ill.
* Sheppard, S. A. D., Boston, Mass.
* Sherman, C. R., Omaha, Neb.
* Smith, J. S., Brunswick, Ga.
Smith, Linville H., Boston, Mass.
* Smith, O. V. R., Des Moines, Ia.
* Stahl, A. W. (Miss), Chicago, Ill.
* Sturmer, J. W., Lafayette, Ind.
* Teeters, W. J., Iowa City, Ia.
Todd, A. M., Kalamazoo, Mich.
Voss, G. W., Cleveland, O.
Wangler, C. D., Waterloo, Ia.
* Whelpley, H. M., St. Louis, Mo.
Wilbert, M. I., Philadelphia, Pa.
* Wirthman, J. C., Kansas City, Mo.
Woolsey, J. F., Indianapolis, Ind.
* Wooten, Thos. V., Chicago, Ill.
Wright, C. L., Webb City, Mo.
*† Yaple, Florence (Miss), Phila., Pa.

# LIST OF NEW MEMBERS.

Adams, Frank M., Forney, Tex.
Ambrose, Olney A., St. Louis, Mo.
* Anderson, Rudolph J., New Orleans, La.
Angermueller, Wm. F., St. Louis, Mo.
Anspach, Paul B., Easton, Pa.
Baert, George H., Grand Rapids, Mich.
Balkcom, Victor F., Tallahassee, Fla.
Bastian, Otto C., South Bend, Ind.
Bauer, Jonathan M., Cleveland, O.
Bausch, Oscar F., St. Louis, Mo.
Benson, John M., Richmond, Va.
Berner, Carl A., Des Moines, Ia.
Berry, Robert H., Cynthiana, Ky.
Beukema, Jas. A., Grand Rapids, Mich.
Billetdoux, Chester A., Philadelphia, Pa.
Blakeslee, Louis G., St. Louis, Mo.
Blome, Walter H., Ann Arbor, Mich.
Boberg, Otto, J. S., Eau Claire, Wis.
* Boulton, Emison A., San Francisco, Cal.
Boyd, Guy S., York, Pa.
Bradt, Warren L., Albany, N. Y.
Brandel, Irvin W., Madison, Wis.
Brewer, Justin S., Hoboken, N. J.
Brown, Adin N., Missouri Valley, Ia.
Brown, J. Lee, Marshfield, Ore.
Buchanan, C. G., Wellsburg, W. Va.
Busch, Miers, Philadelphia, Pa.
Calkins, Eleazer E., Ann Arbor, Mich.
Capbern, Andrew E., White Castle, La.
Carmack, George W.. Plattsburg, Mo.
Carl Lee, Reuben B., England, Ark.
Cary, Silas B., Kansas City, Mo.
Chipman, Gilbert S., Cambridge, Mass.
Chittick, Justus R., Des Moines, Ia.
Congdon, George G., Newport News, Va.
Conover, James A., Jacksonville, Fla.
Coonley, Chas., South Bend, Ind.
Cox, Daniel R., Tallahassee, Fla.
Crawford, Joseph, Philadelphia, Pa.
Creighton, Miss Mary L., Scio, O.
Culpepper, Thos. J., Greenville, Ga.
Daboll, Horace H., New London, Conn.
Darby, Edmund F., Harrow, Ont., Can.
Davis, Chas. H., Bangor, Me.
Davison, Chas. C., Columbus, Ga.
Dietz, Emil, Milwaukee, Wis.
Dillon, Wm. E., Detroit, Mich.
Dodson, Jas. G., Americus, Ga.
Doersam, Philip, Jr., Scranton, Pa.
Donahue, Henry, San Francisco, Cal.
Dorsheimer, Geo. V.. Des Moines, Ia.
Dort, Edward H., Auburn, Neb.
Douglas, John N., Philadelphia, Pa.
Downing, Ernest A., Des Moines, Ia.
Dunn, Joseph H., New Orleans, La.
Eckler, Chas. R., Elyria, O.
Elder, Herbert P., Woodland, Cal.
Englehard, Geo. P., Chicago, Ill.
English, Geo. E., Cleveland, O.
Fernandez, Benito J., Tampa, Fla.
Fink, Daniel J., Holdrege, Neb.
Firth, Samuel S., Cleveland, O.
Fishman, Casriel, St. Louis, Mo.
Fox, Wm. M., Cleveland, O.
Frailey, Wm. O., Lancaster, Pa.
French, Rolland H., Cincinnati, O.
Fricke, Frederick G., Plattsmouth, Neb.
Gallenkamp, Edward W., Washington, Mo.
Gann, Henry, Columbus, Ga.
Graule, Otto H., Woolstock, Ia.
Greenthal, Julius, Detroit, Mich.
Greule, Albert M., Newport, Ky.
Groves, Henry C., Ocala, Fla.
Guidry, Ambrose J., New Orleans, La.
Hagans, Daniel A., Monroe, Mich.
Hamilton, Clarence B., Longview, Tex.
Haney, Thos. C., Columbus, O.
Hardman, Lamartine G., Harmony Grove, Ga.
Harper, Harry L., Beatrice, Neb.

* Joined in 1902; names received too late for publication in the 50th volume of Proceedings.

Harvey, Geo. A., Little Rock, Ark.
Harvey, Wade, Kosciusko, Miss.
* Hazard, Elmer C., Shrewsbury, N. J.
Heath, Geo. M., Big Rapids, Mich.
Herb, Joseph, Superior, Wis.
Herold, Ladimir, Cleveland, O.
Heuisler, Philip I., Baltimore, Md.
Higgins, Edward A., Des Moines, Ia.
Hodgkinson, Albert E., Devil's Lake, N. Dak.
Hodgson, Joseph A., New Haven, Conn.
Hoge, John S., Macon, Ga.
Hopping, Chas. E., Beaver City, Neb.
Ittner, Wm. F., St. Louis, Mo.
Jamieson, Geo. A., Bridgeport, Conn.
Jamieson, Thos. N., Chicago, Ill.
Janssen, Jacob S., Milwaukee, Wis.
Jeffers, Clyde N., Yukon, Okla. Terr.
Johnson, Ambrose, Jacksonville, Tex.
Johnson, Chas. W., Seattle, Wash.
Johnson, Fletcher V., St. Louis, Mo.
Jones, Philip M., San Francisco, Cal.
Jones, William D., Jacksonville, Fla.
Kahn, Harry, Chicago, Ill.
Katz, Gustave, New Orleans, La.
Kemp, Edward, New York, N. Y.
Kendall, John L., Omaha, Neb.
Kendall, Wallace W., Superior, Neb.
Kirchgessner, Wm. C., Grand Rapids, Mich.
Kirk, James E., Jacksonville, Fla.
Kleine, Oscar C., Jr., Brooklyn, N. Y.
Kleinschmidt, Augustus A., St. Louis, Mo.
Klie, Carl G. E., St. Louis, Mo.
Koch, Augustus F., Amana, Ia.
Krembs, Ernst M., Milwaukee, Wis.
Lamont, William H., St. Louis, Mo.
Lascoff, Jacob L., New York, N. Y.
Lawson, Chas. E., Kansas City, Mo.
Leeb, Theodore F., Winona, Minn.
* Leedom, Chas., Philadelphia, Pa.
Lester, Leon T., St. Louis, Mo.
Liersch, Clemens, Kansas City, Mo.
Lyford, Earle H., Berlin, N. H.
Lyon, Arthur G., Coldwater, Mich.
Maass, Wm. F., Brooklyn, N. Y.
Mann, Chas. F., Detroit, Mich.
Marion, Etienne J., New Orleans, La.
Martin, James, Reyno, Ark.
Matthews, Loderick, Miami, N. Y.
McCauley, Chas. E., Oak Park, Ill.
McCormick, Louis C., Lake City, Fla.
McCrary, Walter H., Jeffersonville, Ga.
McIlravy, Maude J., Magnolia, O.
McIntrye, Ewen, Jr., New York, N. Y.
McKay, Felix E., Troupe, Tex.
Merrell, Hubert S., St. Louis, Mo.
Mieding, Albert E., Milwaukee, Wis.
Mikkelsen, Niels, Cherokee, Ia.
Mitchell, Francis D., Kansas City, Mo.
Mitermiler, John A., Cleveland, O.
Montgomery, Harriet E., Norton, Kan.
Mosely, Lawrence J., Tampa, Fla.
Moyer, Lewis N., Robesonia, Pa.
Muir, John D., Grand Rapids, Mich.
Murray, Alex., San Jose, Costa Rica.
Neu, Daniel A., Weehawken, N. J.
Niece, Frederic E., New York, N. Y.
O'Connell, Chas. J., Detroit, Mich.
Oertel, Alfred A., Cleveland, O.
Ohliger, Willard, Detroit, Mich.
Overton, Burr M., Louisville, Ky.
Patch, James A., Beirut, Syria.
Peck, Percy S., Grand Rapids, Mich.
Peters, Henry A., Oconomowoc, Wis.
Pfluger, Henry C., Honolulu, T. H.
Pierce, Fred., St. Joseph, Mo.
Pino, Miguel, Ybor City, Tampa, Fla.
Pirie, Alfred M., Cartago, Costa Rica.
Pitts, Wm. B., Atlanta, Ga.
Pond, Raymond H., Chicago, Ill.
Printup, Daniel, Augusta, Ga.
Reymond, John P., Kansas City, Mo.
Riess, Herman W., Fort Leavenworth, Kan.
Riggio, Joseph, Tampa, Fla.
Rogg, Chas. W., Des Moines, Ia.
Rowell, Samuel F., Excelsior Springs, Mo.
Ryerson, Maurice W., Omaha, Neb.
Sauerhering, Edward, Mayville, Wis.
Scarboro, Turner A., Lyons, Ga.
Schadt, Conrad, Amana, Ia.
Schaffer, Chas., Brooklyn, N. Y.
Schenck, Henry, New York City, N. Y.
Schrodt, Jacob, Terrell, Tex.
Schmidt, Walter K., Grand Rapids, Mich.
Sempel, Henry B., Jr., Easton, Pa.
Settle, James A., Yukon, Okla. Terr.
Seymour, James, Norman, Okla. Terr.
Siebe, Henri O., Lumberton, Miss.
Sills, Frederic W., Chicago, Ill.
Simenstad, Martin O., Edmore, N. D.

* Joined in 1902; names received too late for publication in the 50th volume of Proceedings.

Simmons, Gustav T., Gilt Edge, Mont.
Sims, Henry U., Longview, Tex.
Smith, Edward J., San Francisco, Cal.
Smith, Harley E., Riverside, Cal.
Smith, J. Schall, York, Pa.
Smith, John S., Brunswick, Ga.
Smith, Oliver V. R., Des Moines, Ia.
Smith, Otis W., Sedalia, Mo.
Snow, Clyde M., Chicago, Ill.
Sorency, Robert, Warrensburg, Mo.
Southard, Frank A., Washington, D. C.
Stacy, Marion F., Tuscola, Ill.
Stahl, Amanda W., Chicago, Ill.
Stearns, Wm. L., New York, N. Y.
Sterett, Walter B., Joplin, Mo.
Stevens, Edward, Washington, D. C.
Stevens, Frederick S., Auburn, Cal.
Stewart, Harry E., Jacksonville, Fla.
Stockton, R. C., Richmond, Ky.
Stolle, Henry J., St. Louis, Mo.
Stone, Sarah E., Jones City, Okla. Ty.
Swann, Samuel V. B., New York, N. Y.
Trolinger, E. F., Bell Buckle, Tenn.
Ulch, Jas. J., Des Moines, Ia.
Vadboncoeur, Edmond, Montreal, Can.
Van Derveer, Robert H., Red Bank, N. J.
Wall, Otto A., Jr., St. Louis, Mo.
Walling, Rufus O., Keyport, N. J.
Walker, Alfred L., Detroit, Mich.
Webber, Arthur H., Cadillac, Mich.
White, Howell C., Hawkinsville, Ga.
Whitney, David V., Kansas City, Mo.
Wicks, Jesse H., Forsyth, Mont.
Wilcox, Levi, Waterbury, Conn.
Wilson, Elmer L., St. Paul, Neb.
Wirthman, John G., Kansas City, Mo.
Wirthman, Jos. C., Kansas City, Mo.
Wolcott, Abraham L., Philadelphia, Pa.
Wolff, Gustave, New York, N. Y.
Woolsey, Jesse F., Indianapolis, Ind.
Zinn, Chas. E., Kansas City, Mo.
Zottman, Wm. H., Burlington, Vt.

# LIST OF LIFE MEMBERS.

PUBLISHED IN ACCORDANCE WITH RESOLUTIONS OF THE COUNCIL.

SEE PROCEEDINGS, 1888, PAGE 41.

[Names of Life Members under the Old Constitution in *Italics;* under the present By-Laws, in SMALL CAPITALS.]

*Abernethy, Maxwell.*
BALLARD, JOHN W.
*Bartlett, N. Gray.*
BAUER, LOUIS G.
*Best, John.*
BIROTH, HENRY.
BLAKE, JAMES E.
BORING, EDWIN M.
*Calvert, John.*
CANDIDUS, PHILIP C.
CANNING, HENRY.
CARRELL, EUGENE A.
CASPER, THOS. J.
CHANDLER, CHAS. F.
*Colton, James B.*
*Crossman, George A.*
*Dearborn, George L.*
*DeForest, W. P.*
DIEHL, C. LEWIS.
DOBBINS, EDWARD T.
DOHME, CHAS E.
DOHME, LOUIS.
*Doliber, Thomas.*
DRAKE, JOHN R.
DRURY, LINUS D.
DUNN, JOHN A.
EBERT, ALBERT E.
*Eckford, Joseph W.*
ELLIOTT, HENRY A.
*Ellis, Evan T.*
EMICH, COLUMBUS V.
FISH, CHAS. F.
FOUGERA, EDMUND C. H.
FROHWEIN, RICHARD.
FULLER, OLIVER F.
*Gale, Edwin O.*
*Gale, William H.*
GARDNER, ROBERT W.
GEORGE, CHAS. T.
*Goodwin, Wm. W.*
*Gordon, Wm. J. M.*
GROSSKLAUS, JOHN F.
HANCE, EDWARD H.
HANCOCK, JOHN F.
HARLOW, NOAH S.
*Harrington, Frank.*
*Heintzelman, Joseph A.*
HEYDENREICH, EMILE.
*Heyl, James B.*
HOLMES, CLAY W.
HOLZHAUER, CHARLES.
JACQUES, GEORGE W.
*James, F. L.*
JAMIESON, THOS. N.
*Jenks, Wm. J.*
*Jesson, Jacob.*
*Kent, Robert R.*
KING, JAMES T.
KLUSSMANN, HERMANN.
KRAEMER, HENRY.
LAND, ROBERT H.
LEE, JAMES A.
LEIS, GEORGE.
LEMBERGER, JOSEPH L.
LEWELLYN, JOHN F.
LLOYD, JOHN URI.
*Lord, Thomas.*
MAIN, THOMAS F.
MCKESSON, JOHN, JR.
*McIherson, George.*
*Mellor, Alfred.*
MEYER, CHRISTIAN F. G.
MILLER, ADOLPHUS W.
MILLIGAN, DECATUR.
*Moith, Augustus T.*
*Molwitz, Ernest.*

Moore, George.
Moore, Joachim B.
Morris, Lemuel I.
Newman, George A.
Ohliger, Lewis P.
Oleson, Olaf M.
*Ollif, James H.*
Orne, Joel S.
Owens, Richard J.
*Patten, I. Bartlett.*
*Patterson, Theo. H.*
Pettit, Henry M.
Porter, Henry C.
Power, Frederick B.
Prescott, Albert B.
Ramsperger, Gustavus.
*Rano, Charles O.*
Remington, Joseph P.
*Ridgway, Lemuel A.*
*Rittenhouse, Henry N.*
Robinson, James S.
*Rollins, John F.*
Rumsey, Sam'l L.
Runyon, Edward W.
Sander, Enno.
Sargent, Ezekiel H.
Saunders, William.
Scheffer, Henry W.
Seabury, George J.
*Sharp, Alpheus P.*
Sheppard, Samuel A. D.
Shinn, James T.
Shoemaker, Richard M.
Shurtleff, Israel H.
Simms, Giles G. C.
Skelly, James J.
*Snyder, Ambrose G.*
Stacey, Benjamin F.
Steele, James G.
*Sweeney, Robert O.*
*Thompson, William B.*
*Vernor, James.*
Voiss, Arcadius.
Waugh, George J.
Wellcome, Henry S.
Whelpley, Henry M.
Whitfield, Thomas.
*Wiegand, Thomas S.*
Wilson, Benjamin O.
Winkelmann, John H.
Winter, Jonas.
Woltersdorf, Louis.
*Woodruff, Roderick S.*
Yorston, Matthew M.
Ziegler, Philip M.
Zoeller, Edward V.

Note.—Names of life members whose residence has been unknown for five consecutive years, are no longer published in the above list, in accordance with the action of the Council approved at the forty-eighth annual meeting. (See Proceedings 1900, p. 18.).

# GENERAL INCORPORATION LAW FOR THE DISTRICT OF COLUMBIA.

## Sections Applicable to the American Pharmaceutical Association.

### Class 3, Societies, Benevolent, Educational, etc.

Sec. 545. Any three or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts, may make, sign, and acknowledge before any officer authorized to take acknowledgment of deeds in the District, and file in the office of the Recorder of Deeds, to be recorded by him, a certificate in writing, in which shall be stated:

First. The name or title by which such society shall be known in law.

Second. The term for which it is organized, not exceeding twenty years.

Third. The particular business and object of the society.

Fourth. The number of its trustees, directors, or managers for the first year of its existence.

Sec. 546. Upon filing their certificate, the persons who shall have signed and acknowledged the same, and their associates and successors, shall be a body politic and corporate, by the name stated in such certificate; and by that name they and their successors may have and use a common seal, and may alter and change the same at pleasure, and may make by-laws and elect officers and agents; and may take, receive, hold and convey real and personal estate necessary for the purposes of the society as stated in their certificate.

Sec. 547. Such incorporated society may annually, or oftener, elect from its members its trustees, directors, or managers, at such time and place, and in such manner as may be specified in its by-laws, who shall have the control and management of the affairs and funds of the society, and a majority of whom shall be a quorum for the transaction of business; and whenever any vacancy shall happen among such trustees, directors, or managers, the vacancy shall be filled in such manner as shall be provided by the by-laws of the society.

Sec. 548. The trustees, directors, or stockholders of any existing benevolent, charitable, educational, musical, literary, scientific, religious, or missionary corporation, including societies formed for mutual improvement, may, by conforming to the requirements herein, re-incorporate themselves, or continue their existing corporate powers under this chapter, or may change their name, stating in their certificate the original name of such corporation as well as their new name assumed; and all the property and effects of such existing corporation shall vest in and belong to the corporation so re-incorporated or continued.

Sec. 549. Such corporations may sell and dispose of any real estate they may acquire by purchase, gift, or devise, as follows: whenever any lot purchased for the use of the corporation, or any building erected thereon, shall become ineligible for the uses for which the lot was purchased or the building erected, to be determined by a vote of two-thirds of the shares of the stock of the corporation or the members of the corporation, at a meeting of the stockholders, or corporators, or members specially called for that purpose, the proceedings of which meeting shall be duly entered in the records of the

corporation; said lot or building may be sold, and the proceeds thereof may be vested in another lot, or in the erection of another building, or both.

SEC. 550. When any real estate shall have been devised or given to any such corporation for any specified benevolent purpose, and where, by a vote of three-fourths of the stock held by the stockholders, or three-fourths of the corporators, if no shares of stock have been created, at a meeting called for the purpose, of which such stockholders or corporators or members shall have at least ten days' notice, the corporation shall determine to surrender their corporate powers and cease to act under the same, said real and personal estate so acquired shall be sold at public auction, proper notice of the time and place of sale having been given, and the proceeds of the sale equitably distributed among the stockholders or corporators, or disposed of for the promotion and advancement of the objects for which such corporation was originally organized.

SEC. 551. No corporation acting under the six preceding sections shall hold real estate more than five years, except so much as shall be necessary for the purposes named in its certificate.

SEC. 552. The provisions of this chapter shall not extend or apply to any association or individual who shall, in the certificate filed with the Recorder of Deeds, use or specify a name or style the same as that of any previously existing incorporated body in the District.

*Approved 5 May, 1870, c. 80, v. 16, pp. 98–116—Revised Statutes of the United States, relating to the District of Columbia.*

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## CERTIFICATE OF INCORPORATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Whereas, we, the undersigned, desire to form an association having for its object to unite the educated and reputable Pharmacists and Druggists of America, as will more fully hereinafter appear;

Now, therefore, we do hereby certify as follows:

*First*, The corporate name of the association is the American Pharmaceutical Association.

*Second*, This association shall continue until dissolved by the action of its members, or by the operation of law.

*Third*, The objects and business of said Association are as follows:

*a*. To improve and regulate the drug market by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulterations.

*b*. To encourage proper relations between Druggists, Pharmacists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

*c*. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and in encouraging home production and manufacture in the several departments of the drug business.

*d*. To regulate the system of apprenticeship and employment, so as to prevent, so far as possible, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

*e*. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

*f*. To uphold standards of authority in the education, theory and practice of Pharmacy.

*g*. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and the greatest protection to the public.

*Fourth*. The concerns and affairs of the Association shall be managed by a Council, which shall consist for the first year of John U. Lloyd, Maurice W. Alexander, Alexander K. Finlay, Karl Simmon, Samuel A. D. Sheppard, John M. Maisch, James Vernor, C. Lewis Diehl, William H. Rogers, William Saunders, Albert E. Ebert, Philip C. Candidus, George W. Kennedy, Albert H. Hollister, James M. Good, Lewis C. Hopp and William Dupont.

Given under our respective hands and seals this 12th day of December, A. D. 1887.

Signed:

JOHN U. LLOYD,
ALEX. K. FINLAY,
SAMUEL A. D. SHEPPARD,
JAMES VERNOR,
WILLIAM H. ROGERS,
ALBERT E. EBERT,
GEORGE W. KENNEDY,
JAMES M. GOOD,
MAURICE W. ALEXANDER,
KARL SIMMON,
JOHN M. MAISCH,
C. LEWIS DIEHL,
WM. SAUNDERS,
PHILIP C. CANDIDUS,
ALBERT H. HOLLISTER,
LEWIS C. HOPP,
WILLIAM DUPONT,

Members of the Council,

And

JOHN A. MILBURN,
E. B. BURY,
W. S. THOMPSON,
CHARLES CHRISTIANI,
A. J. SCHAFHIRT,
O. H. COUMBE,
GEO. B. LOCKHART,
T. C. MURRAY,
JOSEPH R. WALTON,
G. G. C. SIMMS,
Z. W. CROMWELL,
JOHN R. MAJOR,
W. G. DUCKETT,
GEO. W. BOYD,
HENRY A. JOHNSTON,
W. C. MILBURN,
ARTHUR NATTANS,
THOMAS M. WEHRLY,

of the District of Columbia.

(Notaries' certificates attached to the original document attest the genuineness of each and every signature.)

Received for Record February 21st, 1888, at 1:05 P. M., and recorded in Liber No. 4, fol. 302, Acts of Incorporation, District of Columbia, and examined.

Signed: JAMES M. TROTTER, *Recorder*.

SEAL:
Office of Recorder of Deeds,
District of Columbia,
Washington, D. C.

# CONSTITUTION AND BY-LAWS

OF THE

# AMERICAN PHARMACEUTICAL ASSOCIATION.

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## CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians, and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

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# BY-LAWS.

## CHAPTER I.

*Of the President and Vice-Presidents.*

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

## CHAPTER II.

### *Of the General Secretary.*

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary of $1000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays, and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report of the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act. He shall notify every member at least two weeks in advance of the time and place of each annual meeting.

## CHAPTER III.

### *Of the Local Secretary.*

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

## CHAPTER IV.

### *Of the Treasurer.*

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary of $750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of $5,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or a Trust Company acceptable to the Council.

## CHAPTER V.

### *Of the Reporter on the Progress of Pharmacy.*

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary of $750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such statistical and biographical notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting, unless such meeting is held previous to August 1. An introduction or synopsis of the Report is to be presented to the Section on Scientific Papers.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

## CHAPTER VI.

### *Of the Council.*

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of twenty-two members, nine of whom, se-

lected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. None but *ex-officio* members of the Council shall be eligible for re-election thereto until one year after the expiration of their term of office.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, the Chairmen of the Sections of the Association, and the Secretary of the Council, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

*Section* 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

*Section* 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

*Section* 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears, one copy of the annual Report of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sessions of the Association and of the Sections, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as it may deem worthy of insertion. It shall also fix the price at which the Proceedings may be sold.

## CHAPTER VII.

### *Of Membership.*

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany, who may be especially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of the Constitution and By-laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of membership for non-payment of dues shall be re-admitted only after having again made application in regular form—the application being accompanied by the usual fee—and shall also have made an additional payment of five dollars, for which he shall not be entitled to any volume of the Proceedings.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of three-fourths of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any applications for membership made prior to March 1 shall be considered as of the the current fiscal year.

ARTICLE III. Every member shall pay in advance to the Treasurer the sum of *Five Dollars* as his yearly contribution, and by neglecting to pay said contribution for *three successive years* he may be dropped from the Roll.

ARTICLE IV. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, or after twenty-five years $30, or after thirty years $20, or after thirty-five years $10, also any member who shall have paid to the Treasurer annual dues for thirty-seven years, shall become a life member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials shall be sent to the General Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

## CHAPTER VIII.

### *Of Meetings and Sections.*

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, four Sections shall be formed, as follows: 1. Section on Scientific Papers; 2. Section on Commercial Interests; 3. Section on Practical Pharmacy and Dispensing; 4. Section on Pharmaceutical Legislation and Education.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. At the third session the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. At the fourth and fifth sessions the Section on Pharmaceutical Legislation and Education shall consider the business assigned to that Section.

ARTICLE VII. The sixth and seventh sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

ARTICLE VIII. The eighth and ninth sessions shall be devoted to the subject of Practical Pharmacy and Dispensing.

ARTICLE IX. A Chairman and a Secretary shall be elected by ballot by each Section to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE X. The Chairman of each Section shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the annual meeting.

ARTICLE XI. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging

in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XII. The order of business at the first session of each annual meeting shall be as follows:

*Section* 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

*Section* 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

*Section* 3. Nineteen members shall constitute a quorum for the transaction of business.

*Section* 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

*Section* 5. Reports of Committees shall be presented, read by their titles, synopsis or in full, and laid on the table for future consideration.

*Section* 6. The President shall call the roll of States, the Territories, District of Columbia and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association at large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

*Section* 7. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, its acts shall be revised, so as to be acceptable to the Association.

*Section* 8. A committee of five on time and place of meeting shall be appointed by the President at the first session, to report at the second session.

*Section* 9. Incidental business.

ARTICLE XIII. The order of business at the second general session at each annual meeting shall be as follows:

*Section* 1. The President shall call the Association to order.

*Section* 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

*Section* 3. The Report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the persons nominated shall be balloted for.

*Section* 4. Reading of the Minutes of the Council.

*Section* 5. The Council shall report at the annual meeting the names of all newly-elected members.

*Section* 6. Reading of the Reports of the Treasurer and General Secretary.

*Section* 7. Reports of Standing Committees shall be read.

*Section* 8. Reports of Special Committees shall be read.

*Section* 9. Incidental business.

ARTICLE XIV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVI. At the last general session of the Association the newly-elected officers of the Association shall take their respective places.

ARTICLE XVII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

## CHAPTER IX.

### *Of Committees.*

ARTICLE I. There shall be appointed or elected eight Standing Committees as follows: a Committee on Commercial Interests, a Committee on the Revision of the Pharmacopœia, a Committee on Practical Pharmacy and Dispensing, and a Committee on Pharmaceutical Legislation and Education, each to consist of five members; a Committee on Scientific Papers, a Committee on the Ebert Prize, a Committee on General Prizes, each to consist of three members; and a Committee on Transportation, to consist of ten members.

ARTICLE II. The Committee on Commercial Interests shall be elected by the Section on Commercial Interests. It shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. It shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be elected by the Section on Scientific Papers. It shall arrange the business of the Section, and shall report a number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person preparing a paper for the Association which will require more than ten minutes for its reading, must accompany the same with a synopsis which can be read within ten minutes' time. The paper and synopsis must both be furnished the Committee of the particular Section to which it refers, previous to the first session.

ARTICLE V. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE VI. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE VII. The Committee on Practical Pharmacy and Dispensing shall be elected by the Section on Practical Pharmacy and Dispensing. It shall arrange in advance the business to come before the Section at the next annual meeting. It shall propose a series of subjects for general discussion, and solicit papers on subjects pertaining to the actual practice of pharmacy in retail stores.

ARTICLE VIII. The Committee on Pharmaceutical Legislation and Education, which shall be elected by the Section on Pharmaceutical Legislation and Education, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. It shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year. It shall arrange the business of the Section in advance of its sessions, propose

suitable subjects for discussion, and shall attend to such duties as may be delegated to it by the Section. It shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE IX. The Committee on Revision of the United States Pharmacopœia shall be appointed by the President of the Association. It shall collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia, so as to facilitate and aid the work of the National Committee on Revision of the U. S. P.

ARTICLE X. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

## CHAPTER X.

### *Rules of Order and Debate.*

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

## CHAPTER XI.

### *Miscellaneous.*

ARTICLE I. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-Laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

ARTICLE III. No one or more of these By-Laws shall be suspended.

# BY-LAWS OF THE COUNCIL.

## CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of the new members of the Council by the Association.

## CHAPTER II.

*Of the Chairman and Vice-Chairman.*

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

## CHAPTER III.

*Of the Secretary.*

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary of $150.

ARTICLE II. He shall post in a conspicuous place in the meeting-room the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

ARTICLE IV. The Secretary of the Council shall also officiate as Secretary of the Committee on Membership, and for such services shall receive an additional salary of $150.00.

## CHAPTER IV.

*Of Committee on Membership.*

ARTICLE I. The Committee on Membership shall consist of seven members of the Council, to be elected annually by ballot. The General Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect its chairman immediately after the election of its members by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present to the Council the list of applicants for membership who have complied with the requirements of the By-Laws of the Association.

ARTICLE III. It shall furnish appropriate biographical sketches of deceased members for publication in the Report of the Proceedings.

## CHAPTER V.

### *Of Committee on Publication.*

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council. Immediately after its election by the Council, the Committee shall elect a Chairman.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Report of the Proceedings.

## CHAPTER VI.

### *Of Committee on Finance.*

ARTICLE I. The Committee on Finance shall consist of three members, who shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

## CHAPTER VII.

### *Of the Centennial Fund.*

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

## CHAPTER VIII.

*Of Sessions.*

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and the Secretary.
2. Election of the Standing Committees of Council, as follows:

*a.* Committee on Membership, consisting of seven members of the Council, the General Secretary and the Treasurer.

*b.* Committee on Finance, three members.

*c.* Committee on Publication, five members.

*d.* Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

## CHAPTER IX.

*Miscellaneous.*

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

# SECTION ON COMMERCIAL INTERESTS.

## ORDER OF BUSINESS.

1. Calling the Section to Order.
2. Reading of the Chairman's Address.
3. Reports of Committees.
4. Reading of Papers.
5. New Business and Discussion.
6. Nomination and Election of Officers for the ensuing yea
7. Installation of Officers.
8. Reading of the Minutes.
9. Adjournment.

# SECTION ON EDUCATION AND LEGISLATION.

## ORDER OF BUSINESS.

### First Session of the Section.

1. Calling the Section to Order.
2. Reading of the Address of the Chairman.
3. Report of the Secretary.
4. Reports of Committees.
5. Nominations of Officers for the ensuing year. The election to take place at the opening of the second session.
6. Reading of Papers and Discussion.
7. Adjournment.

### Second Session of the Section.

1. Reading of Minutes of the previous session.
2. Election of Officers for the ensuing year.
3. Reports of Committees.
4. Reading of Papers and Discussion.
5. New Business.
6. Installation of Officers.
7. Reading of Minutes.
8. Final Adjournment.

# SECTION ON SCIENTIFIC PAPERS.

## ORDER OF BUSINESS.

### First Session of the Section.

1. Calling the Section to Order.
2. Reading of the Chairman's Address.
3. Reports of Committees, if there be any to make, and appointment of such new Committees as may appear desirable.
4. Nominations (but not elections at this sitting) for the new officers of the Section.
5. Reading of Papers and discussions on the subjects brought up.
6. Adjournment.

### Second Session of the Section.

1. Reading of Minutes of previous Session.
2. Election of Officers for the ensuing year. Further nominations may be made at this time.
3. Reports of Committees—Incidental Business.
4. Reading of Papers and Discussion.
5. Installation of Officers.
6. New Business.
7. Reading of Minutes.
8. Final Adjournment.

# SECTION ON PRACTICAL PHARMACY AND DISPENSING.

## ORDER OF BUSINESS.

### First Session of the Section.

1. Calling the Section to Order.
2. Reading of the Chairman's Address.
3. Discussion of Topics presented in Chairman's Address.
4. Reports of Committees.
5. Reading of Papers.
6. Exhibition of rare prescriptions and difficulties in compounding.
7. Nominations of Officers.
8. Adjournment.

### Second Session of the Section.

1. Reading of Minutes of previous Session.
2. Election of Officers for ensuing year.
3. Exhibition of new or interesting apparatus or inventions.
4. Exhibition of rare or new drugs and pharmaceutical preparations.
5. Reading of papers.
6. Installation of Officers.
7. New business.
8. Reading of Minutes.
9. Final Adjournment.

# GENERAL RULES OF FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888, 1895, 1900, 1901, 1903.

*First*, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

*Second*, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

*Third*, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

*Fourth*, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

*Fifth*, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

*Sixth*, There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, the Chairman to be a member of the Finance Committee.

*Seventh*, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

*Eighth*, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Auditing Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council, in the presence of another member of the Association, shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association.

*Ninth*, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, saving-bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Auditing Committee.

*Tenth*, There shall be a meeting of the Auditing Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

*Eleventh*, The expense of the bond of the Treasurer, given by a Trust Company, shall be paid for from the Treasury.

*Twelfth*, The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

*Thirteenth*, The Finance Committee shall each year, previous to June 1st, present to the Council for its consideration a list of appropriations to cover the various expenditures of the coming fiscal year, the total of such appropriations to be based on the probable amount to be received from the annual dues for the coming year. No payment shall be made in excess of said appropriation except by special vote of the Council. *Provided*, however, that the Treasurer shall be authorized to transfer from one account to another, such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (50) dollars.

*Fourteenth*, All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

# FORM OF APPLICATION FOR MEMBERSHIP.

No.....

## AMERICAN PHARMACEUTICAL ASSOCIATION.

### APPLICATION FOR MEMBERSHIP.

For meeting at.....

---

APPROVING of the objects of the American Pharmaceutical Association, and having read Article I. of its Constitution and Articles I. to IV. of Chapter VII. of the By-laws, I hereby signify my approval of the same, and subscribe to them. I also enclose the first year's annual contribution, five dollars.

Name in full*.....

Number and Street.....

Date .....

Town and State.....

Recommended by the undersigned two members in good standing:

Name.....

Name.....

To be sent to Dr. H. M. Whelpley, Secretary Committee on Membership A. Ph. A., 2342 Albion Place, St. Louis, Mo.

Members may obtain a certificate of membership (on paper for $5, on parchment, $7.50) from S. A. D. Sheppard, Treasurer A. Ph. A., 1129 Washington St., Boston, Mass.

Notice of change of address should be given without delay to Charles Caspari, Jr., General Secretary A. Ph. A., 109 Aisquith St., Baltimore, Md.

Paid.....

---

* Write legibly or print name.

# ROLL OF MEMBERS.

## HONORARY MEMBERS.

### FOREIGN COUNTRIES.

#### ENGLAND.

Dr. John Attfield, F. R. S., *Watford*, 1871.
Michael Carteighe, F. I. C., *London*, 1882.
Joseph Ince, F. L. S., *London*, 1882.
E. M. Holmes, F. L. S., *London*, 1899.

#### GERMANY.

Dr. Edward Schaer, *Strassburg*, 1877.
Dr. Frederick Hoffmann, *Berlin*, 1898.
Dr. Carl Schacht, *Berlin*, 1882.
Dr. Ernst Schmidt, Geh. Reg. Rath, *Marburg*, 1899.

#### INDIA.

David Hooper, F. I. C., F. C. S., *Calcutta*, 1899.

#### RUSSIA.

Johannes von Martenson, Staatsrath, *St. Petersburg*, 1882.

# ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in SMALL CAPITALS. Names of Life Members under the old Constitution in *italics*.)

## UNITED STATES OF AMERICA.

### ALABAMA.

*Anniston.*

Wikle, Jesse Lane.....1898

*Auburn.*

Miller, Emerson Romeo.....1895

*Mobile.*

CANDIDUS, PHILIP CHARLES.....1857
Punch, William Francis.....1874

*Montgomery.*

Knabe, Gustavus Alexander.....1876.

### ARIZONA.

*Prescott.*

Brisley, Harry.....1894

### ARKANSAS.

*Batesville.*

Fletcher, John Wade.....1894

*Camden.*

Green, Samuel Leonard.....1901
Morgan, Aylmer Lee.....1890

*El Dorado.*

Appleton, William Riley.....1901

*England.*

Carl-Lee, Reuben Bates.....1903

*Fort Smith.*

Sparks, James Mitchell.....1894

*Helena.*

King, Robert Bruce.....1901

*Hope.*

Battle, Orrin McRee.....1902

*Hot Springs.*

Chesnutt, James H.....1901
Klein, Ernest Frederick.....1894

*Little Rock.*

Bond, John Barnitz.....1883
Bond, John Barnitz, Jr.....1902
Dowdy, Joseph Franklin.....1894
Harvey, George Arthur.....1903
Snodgrass, Latta Kavanaugh.....1901

*Pine Bluff.*

Dewoody, William Lawrence.....1887

*Reyno.*

Martin, James.....1903

*Springdale, Wash. Co.*

Laird, John.....1895

### CALIFORNIA.

*Arcata, Humboldt Co.*

Bohmansson, Robert Hugo..... 1901

*Auburn.*

Stevens, Frederick Solon.....1903

*Fullerton, Orange Co.*

Kerr, William Whitman.....1887

*Los Angeles.*

Kirkland, Derwentwater.....1889

*Mare Island.*

Hammer, Alrik.....1897

*Napa.*

Levinson, Joseph....1895

*Ontario.*

*Jesson, Jacob*....1872

*Riverside.*

Smith, Harley Earl....1903

*Sacramento.*

Lichthardt, George Henry Philip....1902

*San Francisco.*

Barbat, Josephine Eugenia....1900
Bayly, Charles Alfred....1889
Beck, Henry Martin....1902
Boulton, Emison Allen....1902
Boyken, John William....1902
*Calvert, John*....1870
Dawson, John Henry....1882
Donohue, Henry....1903
Drossel, August Adolph....1902
Esters von Krakau, James Henry William....1897
Grant, Isaac....1902
Jackson, William John....1900
Jones, Philip Mills....1903
Jorgenson, Edward B....1902
Pearman, William Edgar....1898
Schmidt, Valentine....1887
Schneider, Albert....1899
Searby, William Martin....1882
Sharp, Sol. Albert....1902
Smith, Edward Joseph....1903
Stange, Carl Frederick....1897
STEELE, JAMES GURDEN....1859
Stewart, Francis Edward....1884
Wenzell, William Theodore....1870
Zabaldano, Alexander....1902

*Santa Monica.*

Devine, John....1887

*Sonoma, Sonoma Co.*

Shoults, Robert Grafton....1901

*Vallejo, Solano Co.*

Topley, James....1869

*Woodland.*

Elder, Herbert Percy....1903

COLORADO.

*Central City.*

*Best, John*....1886
Davies, Llewellyn Powell....1891

*Colorado Springs.*

Ward, Augustus Jae....1893

*Cripple Creek.*

Beitenman, William Wallace....1888

*Denver.*

Anglum, John....1902
Depeyre, Louis Noël....1894
Ford, Charles Mangan....1887
Hover, William Adgate....1895
Walbrach, Arthur....1881
Witting, Frederick Frank....1902

*Leadville.*

Kolsch, Julius....1902
Taylor, George Edward....1895

*Pueblo.*

Ford, Edgar Frank....1902

COLUMBIA, DISTRICT OF

*Anacostia.*

Weiss, Conrad Henry....1900

*Washington.*

Boyd, George Washington....1883
Bradbury, Wymond Henry....1895
Campbell, Charles Berger....1902
Criswell, Francis McClure....1892
Duckett, Walter G....1876
Easterday, Herbert Clifton....1893
Elliott, Charles Houston....1899
Field, William Carlin....1898
Flemer, Lewis....1895
Franzoni, Joseph Dunbar....1900
Gordon, Frederick Troup....1900
Gross, Charles Ernest....1900
Henkel, Alice....1902
Henry, Frank Clinton....1894
Herbst, William Parker....1895
Hilton, Samuel Louis....1890
Hurlebaus, George William....1895
Jorgenson, Hans Christian....1899
Kebler, Lyman Frederic....1894
Luve, Frank A. A....1902
Major, John Richards....1873
Martin, John Charles....1883
Milligan, John Dean....1900
Neeley, Guy Minick....1900
Quigley, Richard Lucien....1902
Richardson, Samuel William....1897
Richardson, Willard Stowell....1900

Schreiner, Oswald ..... 1900
Simms, Giles Green Craycroft .... 1860
Southard, Frank Allan ..... 1903
Stevens, Edward ..... 1903
Stott, Samuel Thompson ..... 1900
Taylor, Augustus Carrier ..... 1900
Weller, Franklin Pierce ..... 1900
Wiley, Harvey Washington ..... 1902

## CONNECTICUT.

*Bridgeport.*

Hamilton, William Clinton ..... 1902
Hartigan, Joseph Dennis ..... 1902
Jamieson, George Alexander ..... 1903
Leverty, John Augustine ..... 1900

*Danbury.*

Dickinson, Arthur Lyman ..... 1900

*Hartford.*

Duggan, James ..... 1894
Edwards, Frederick Bulkeley ..... 1894
Rapelye, Charles Andrew ..... 1876
Seinsoth, John Jacob ..... 1900
Stoughton, Dwight George ..... 1890
Williams, John Kirby ..... 1875

*Meriden.*

Mosher, William Wooster ..... 1894

*Middletown.*

Pitt, John Richard ..... 1872

*Naugatuck.*

May, James Oscar ..... 1875

*New Haven.*

Dimock, Robert Hemphill ..... 1889
Gessner, Emil Adolph ..... 1878
Hodgson, Joseph Arthur ..... 1903
Hogan, John Joseph ..... 1890
Mix, Willis Lee ..... 1896
Spalding, Warren Alphonso ..... 1876
Sperry, Herman Jay ..... 1880
Wood, Alonzo Felton, Jr ..... 1890
Wood, James Prior ..... 1890

*New London.*

Daboll, Horace Hart ..... 1903

*Putnam.*

Dresser, George Edward ..... 1886

*Stamford.*

Finch, Charles Smith ..... 1900

*Thompsonville, Hartford Co.*

Smith, Edward Newton ..... 1885

*Waterbury.*

Perkins, Charles William ..... 1892
Wilcox, Levi ..... 1903
*Woodruff, Roderick Samuel* ..... 1876

## DELAWARE.

*Lewes.*

Spangler, Lewis Clayton ..... 1902

*Wilmington.*

Watson, Herbert Kennedy ..... 1888

## FLORIDA.

*De Land.*

Fisher, George Washington ..... 1893

*Jacksonville.*

Conover, James Alexander ..... 1903
Crum, John Darius ..... 1892
Jones, William Daniel ..... 1903
Kirk, James Edgar ..... 1903
Stewart, Harry Erson ..... 1903

*Key West.*

Stier, Carl ..... 1902

*Lake City.*

McCormick, Louis Carlton ..... 1903

*Monticello.*

Palmer, John Dabney ..... 1902

*Ocala.*

Groves, Henry Conrad ..... 1903

*Palatka.*

Ramsaur, David Wilfong ..... 1902

*Pensacola.*

Miller, Charles ..... 1897

*St. Augustine.*

Smith, Lauriston Stephen ..... 1892
Speer, Charles Claude ..... 1902
Woodman, Walter Irving ..... 1893

*Tallahassee.*

Balkcom, Victor Franklin ..... 1903
Cox, Daniel Richard ..... 1903

*Tampa.*

Berger, Ernest ..... 1902
Casalius, Tsidro ..... 1903

Itizarri, Miguel Pino ..... 1903
Mosely, Lawrence Joseph ..... 1903
Quintanal, Benito Julian Fernandez ... 1903
Riggio, Joseph ..... 1903

*Titusville, Brevard Co.*

Dixon, John Marion ..... 1894

*Warrington.*

Grossjohann, Ernst ..... 1900

GEORGIA.

*Americus.*

Dodson, James Glenwell ..... 1903

*Atlanta.*

Dunwody, Richard Gaillard ..... 1891
Hays, Francis Banks ..... 1902
Hood, Reuben Columbus ..... 1902
Payne, George Frederick ..... 1893
Pitts, William Burton ..... 1903
Watson, Sidney Powell ..... 1887

*Augusta.*

Durban, Sebastian Charles ..... 1883
Haines, Walter Scott ..... 1902
LAND, ROBERT HENRY ..... 1859
Land, Robert Henry, Jr ..... 1902
Printup, Daniel ..... 1903

*Bowdon.*

Lovvorn, James Lewis ..... 1897

*Brunswick.*

Smith, John Stovall ..... 1903

*Columbus.*

Davison, Charles Clement, Jr ..... 1903
Gann, Henry ..... 1903

*Dawson, Terrill Co.*

Davidson, Edgar Cyrus ..... 1902

*Elberton.*

Cleveland, Jule Mattox ..... 1902

*Greenville.*

Culpepper, Thomas Jefferson ..... 1903
Gilbert, Robert Bacon ..... 1902
Tigner, James Ogletree ..... 1890

*Harmony Grove.*

Hardman, Lamartine Griffin ..... 1903

*Hawkinsville.*

White, Howell Cobb ..... 1903

*Jeffersonville.*

McCrary, Walter Homer ..... 1903

*Lyons.*

Scarboro, Turner Augustus ..... 1903

*Macon.*

Brunner, Norman Isaac ..... 1878
Cheatham, Thomas Alexander ..... 1890
Hoge, John Sutherland ..... 1903
King, Campbell Thomas ..... 1897
Lamar, Henry James ..... 1897
Morris, Max ..... 1898

*Rome.*

Curry, David W ..... 1894

*Savannah.*

Kolb, William Walter ..... 1897
Rowlinski, Robert Antone ..... 1892
Solomons, Isaiah Abram ..... 1894

*Thomasville.*

Thomas, Robert, Jr ..... 1888

HAWAIIAN ISLANDS.

*Honolulu.*

Pfluger, Henry Christian ..... 1903
RUMSEY, SAMUEL LOUIS ..... 1876

IDAHO.

*Emmett.*

Smithson, David Elmer ..... 1890

ILLINOIS.

*Albion.*

Michels, Victor Clyde ..... 1902

*Alton.*

Riley, Cassius Marcellus ..... 1901

*Aurora.*

Staudt, Louis Carl ..... 1890

*Barry, Pike Co.*

Mercer, Willam Elmer ..... 1902

*Blue Island.*

*McPherson, George* ..... 1865

*Cairo.*

Metzger, Matthias Clyde ..... 1902
Schuh, Paul Gustav ..... 1894

*Camp Point, Adams Co.*

Bartells, George Case ..... 1881

*Carbondale.*

Patten, Eustis.....1900

*Carlinville, Macoupin Co.*

Loehr, Theodore Christian.....1888
Steinmeyer, William Otto.....1901

*Champaign.*

Swannell, Henry.....1902

*Chicago.*

Adamick, Gustave Hattenhauer.....1891
*Bartlett, Nicholas Gray*.....1861
Batt, Herman.....1902
Baur, Jacob.....1879
Behrens, Emil Christian Louis.....1893
BIROTH, HENRY.....1865
Conrad, John.....1887
Cooban, Benjamin Slater.....1902
Day, William Baker.....1895
EBERT, ALBERT ETHELBERT.....1864
Engelhard, George Pierre.....1903
Fisk, Frank Elmer.....1902
Forsyth, William Kitchin.....1902
Fry, Herman.....1902
FULLER, OLIVER FRANKLIN.....1869
*Gale, Edwin Oscar*.....1857
Gale, Walter Henry.....1901
*Gale, William Henry*.....1857
Gordin, Henry Mann.....1899
Gordon, Jean.....1902
Grassly, Charles William.....1884
Gray, Margaret McClintock (Mrs.).....1901
Gray, William.....1892
Hall, Mary Stillwell (Mrs.).....1901
Hallberg, Carl Swante Nicanor.....1879
Hartwig, Otto Julius.....1892
Hereth, Franklin Samuel.....1893
JAMIESON, THOMAS NEVIN.....1903
Kahn, Harry.....1903
*Lord, Thomas*.....1882
Mares, Frank Martin.....1902
Matthews, Charles Edwards.....1893
McConnell, Charles Henry.....1899
Miner, Maurice Ashbel.....1880
Oldberg, Oscar.....1873
Parsons, John.....1865
*Patterson, Theodore Henry*.....1869
Pattison, George Henry.....1893
Pond, Raymond Haines.....1903
Puckner, William August.....1888
Rhode, Rudolph Ernst.....1887
Roesch, Anton.....1901
SARGENT, EZEKIEL HERBERT.....1864
Scherer, Andrew.....1884
Schmidt, Florian Charles.....1882
Schmidt, Frederick Michael.....1887
Sempill, Walter Morrison.....1892
Sills, Frederick William.....1903
Smallwood, William Thornton.....1901
Snow, Clyde Mason.....1903
Stahl, Amanda Wilhelmina.....1903
Stephenson, Charles William.....1902
Thorburn, Albert David.....1902
Truax, Charles.....1882
Turnquist, Carl Martin.....1901
WHITFIELD, THOMAS.....1865
Wisdom, Hugh.....1901
WOLTERSDORF, LOUIS.....1865
Woods, Charles Henry Albert.....1897
Wooten, Thomas Victor.....1893

*Chicago Heights.*

Michalek, John.....1900

*Columbia.*

Rose, Herman Louis.....1901

*East St. Louis.*

Knoebel, Thomas.....1892

*Geneseo.*

Stamm, Dante Milton.....1896

*Girard, Macoupin Co.*

Deck, Lewis Cass.....1901

*Highland.*

Mueller, Adolphus.....1871

*Moline.*

Lindvall, Charles Gustaf.....1897
Sohrbeck, George Henry.....1888
Sohrbeck, George William.....1897

*Mount Vernon.*

Bond, Jackson Newlon.....1902
Morse, Edward Worth.....1896

*North Alton.*

Barth, George Fred.....1896

*Oak Park.*

McCauley, Charles Edward.....1903

*Pekin.*

Ehrlicher, Henry Michael.....1892

*Peoria.*

Benton, Wilber Merritt.....1888
Lueder, Fritz.....1894
Zimmermann, Albert.....1893

*Pesotum.*

Hoffman, George Frederick.....1902

*Pontiac.*

Murphy, John Spence.....1896

*Springfield.*

Dodds, Richard Newton.....1902

*Stronghurst, Henderson Co.*

Harter, Isaac Foster.....1893

*Tuscola.*

Stacy, Marion Franklin.....1903

*Waterloo, Monroe Co.*

Eilbracht, William Edward.....1901

## INDIAN TERRITORY.

*Miami.*

Matthews, Loderick.....1903

## INDIANA.

*Albion, Noble Co.*

Miller, Chas. Elliott.....1899

*Angola.*

Sherrard, Charles Cornell.....1893

*Columbus.*

Otto, Theodor Gotthelf Eduard.....1900
Stahlhuth, Ernst Henry William.....1887

*Fort Wayne.*

Gross, William Otto.....1901
Woodworth, Charles Beecher.....1900

*Indianapolis.*

Arnett, William Newton.....1901
Carter, Frank Henry.....1891
Eads, Robert Isom.....1895
Eichrodt, Charles William.....1892
Field, Claud.....1890
Frauer, Herman Emanuel.....1881
Huder, Henry J.....1894
Hurty, John Newell.....1882
Lilly, Josiah Kirby.....1890
Timberlake, Arthur.....1902
Waddell, Minor T.....1899
Walter, Charles Albert.....1899
Wolcott, Frank Elmer.....1902
Woolsey, Jesse Francis.....1903

*Jeffersonville.*

Loomis, John Clarence.....1876

*Lafayette.*

Glick, Harry Edwin.....1900
Sturmer, Julius William.....1901

*La Porte.*

Meissner, Frederick William, Jr.....1890

*Muncie.*

Prutzman, Charles Oscar.....1901

*New Albany.*

Crecelius, Charles Edgar.....1900
Knoefel, Bruno.....1896
Knoefel, Charles Deitrick.....1894

*South Bend.*

Bastian, Otto Carl.....1903
Coonley, Charles.....1903
Eliel, Leo.....1882
Meyer, Martin Monroe.....1897

*Tell City.*

Schreiber, Charles Christian Frederic August.....1901

*Troy.*

Gaesser, Theobald Theodore.....1901

*Valparaiso.*

Roe, Joseph Newton.....1902

*Warren.*

Hickerson, William Henry.....1894

## IOWA.

*Amana.*

Koch, August Frank.....1903
Schadt, Conrad.....1903

*Boone.*

*Ridgway, Lemuel Augustus*.....1882

*Charles City.*

Legel, John Gotthelf.....1897

*Cherokee.*

Mikkelsen, Niels.....1903

*Clear Lake.*

Etzel, John Leonhardt.....1897

*Coggon.*

Hall, Lincoln Grant.....1902

*Davenport.*

BALLARD, JOHN WINTHROP..... 1871

*Des Moines.*

Berner, Carl Albert.....1903
Chittick, Justus Raymond.....1903
Dorsheimer, George Valentine.... ..1903
Downing, Ernest Albert.....1903
Henry, W. P.....1903
Higgins, Edward A.....1903
Howard, Fletcher .....1895
Kinney, Charles Noyes.....1901
Macy, Sherman Riley .....1891
Rogg, Charles Walter .....1903
Smith, Oliver Vincent Richard .....1903
Ulch, James Joseph.... .....1903

*Dubuque.*

Nachtwey, Frank Joseph .....1901
Torbert, Willard Horatio .....1887
Wittmer, Joseph Washington, Jr. ....1896

*Essex, Page Co.*

Eaton, Harry Ellsworth .....1902

*Fort Dodge.*

OLESON, OLAF MARTIN.....1877

*Fort Madison.*

Schafer, George Henry.....1871

*Homestead.*

Miller, Frederick William .....1902

*Iowa City.*

Boerner, Emil Louis .....1877
Louis, Henry .....1902
Morrison, William Wilson ... .....1902
Shrader, William Edwin.....1902
Teeters, Wilber John.....1902

*Mason City.*

Burns, Edwin Miller .....1897

*Missouri Valley.*

Brown, Adin Noyes... ..... ..1903

*Muscatine.*

Halstead, Alice Louisa (Mrs.) .....1892

*Reinbeck.*

Junger, William Frederick Franklin ..1902

*Sioux City.*

Andreen, Carl.....1902
Baker, Howard Spencer .....1902
Kloster, Benjamin J.....1902
Koelle, Otto Charles .....1902
Moore, Silas Harwood .....1880
Scherling, Gustav.....1884
Thelander, Chreston Carlos .....1902
Thompson, Edwin Thomas.....1902
Thompson, Joseph.....1902

*Stuart.*

Treat, Joseph Augustus.....1885

*Waterloo.*

Wangler, Conrad David .....1876

*Winfield, Henry Co.*

Lindly, John Milton .....1901

## KANSAS.

*Atchison.*

Noll, Mathias.....1901

*Fort Leavenworth.*

Riess, Herman William ..... 1903

*Gypsum City, Saline Co.*

Schmitter, Jonathan.....1892

*Holton, Jackson Co.*

Naylor, William W.....1901

*Kingman.*

Cookson, Joseph Wesley.....1902

*Lawrence.*

Havenhill, L. D.....1900
LEIS, GEORGE.....1869
Moore, John Thomas.....1888
Sayre, Lucius Elmer .....1883

*Leavenworth.*

Fisher, Dora Catherine .....1902

*Morton.*

Montgomery, Harriet Evans.....1903

*Ottawa.*

Becker, Charles Lewis .....1892

*Salina.*

Graf, Carl Adolf.....1901

*Topeka.*

Holliday, Francis Emlen .....1900

*Wilmore.*

Sombart, John Edward.....1881

KENTUCKY.

*Covington.*

Pieck, Edward Ludwig.....1887
Zwick, Karl George.....1899

*Cynthiana.*

Berry, Robert Henry.....1903

*Flemingsburg.*

Reynolds, John Jefferson.....1876

*Frankfort.*

Averill, William Henry.....1874
Gayle, John William.....1891

*Lancaster, Garrard Co.*

Stormes, John Evans.....1902

*Lexington.*

Harting, Rudolph R.....1902
McAdams, Harry Kennett.....1902

*Louisville.*

Bell, Emil Remigius.....1899
Curry, Gordon Laten.....1900
DIEHL, CONRAD LEWIS.....1863
Dilly, Oscar Charles.....1888
Dimmitt, Addison.....1895
Edelen, Charles Augustin.....1901
Holt, Edwin Merrimon.....1902
Jones, Simon Newton.....1870
NEWMAN, GEORGE ABNER.....1866
Overton, Burr Martin.....1903
Peter, Minor Cary.....1894
Schiemann, Edward Bernard.....1880
Schlosser, Peter.....1902
Schoettlin, Albert John.....1882
Troxler, Constantine, Jr.....1896
Votteler, William.....1895

*Newport.*

Greule, Albert Martin.....1903

*Richmond.*

Stockton, Robert Curtis.....1903

*Shelbyville.*

Preissler, Henry Webber.....1893

*Somerset.*

Porter, Chilton Scott.....1882

LOUISIANA.

*New Iberia.*

LEE, JAMES AUGUSTIN.....1856

*New Orleans.*

Allen, Grafton Cleveland.....1902
Anderson, Rudolph John.....1902
Brown, George Stewart.....1900
Capdau, Pierre August.....1902
Dunn, Joseph Henry.....1903
Finlay, Alexander Kirkwood.....1883
Godbold, Fabius Chapman.....1887
Grambois, Augustin.....1891
Guidry, Ambrose Joseph.....1903
Katz, Gustave.....1903
Keppler, Christian Lewis.....1882
Legendre, Joseph Amilcar.....1891
Levy, William Michael.....1894
Lyons, Isaac Luria.....1875
Marion, Etienne James.....1903
Metz, Abraham Lewis.....1887
O'Gorman, Theophilus Vincent.....1897
Otto, John Nicholas Washington.....1891
Quin, Frank Woodard.....1902
Samson, Max.....1900
Sauvinet, Charles Daniel.....1902
Wunderlich, Edward.....1891

*Plaquemine.*

Hiriart, Sebastian.....1891

*Pollock.*

Bonnette, James Valarus.....1902

*Shreveport.*

Bernstein, Michel.....1902

*White Castle.*

Capbern, Andrew E.....1903
Viallon, Paul Louis, Jr.....1902

MAINE.

*Auburn.*

Jones, Oscar Winthrop.....1902

*Augusta.*

Partridge, Frank Reuben.....1895

*Bangor.*

Davis, Charles Howard.....1903
HARLOW, NOAH SPARHAWK.....1859
Sweet, Caldwell.....1881

*Bath.*

Anderson, Samuel ..... 1876

*Biddeford.*

Boynton, Herschel ..... 1875
Seidel, John Henry ..... 1902
Traynor, Charles Francis ..... 1902

*Lewiston.*

Lowell, Edward Mark ..... 1896
Parmalee, Walter Woodruff ..... 1901
Sanford, John Foy ..... 1902

*Machias.*

Crane, Frank Trussell ..... 1894

*Oldtown.*

Mutty, Walter Clement ..... 1902

*Orono.*

Jackman, Wilbur Fisk ..... 1899

*Portland.*

Cook, Alfred Page ..... 1902
Drew, Walter Israel ..... 1896
Frye, George Carlton ..... 1879
Hay, Edward Allston ..... 1889
Morse, Frank Dana ..... 1902
Perkins, Benjamin Abbott ..... 1878
Schlotterbeck, Augustus George ..... 1896

*Saco.*

Sawyer, Charles Henry ..... 1896

*South Windham.*

Rand, Daniel Moulton ..... 1892

*Waterville.*

Dorr, George Watson ..... 1896

## MARYLAND.

*Annapolis.*

Henkel, Charles Bernard ..... 1902

*Baltimore.*

Barnett, Joel Jones ..... 1899
Base, Daniel ..... 1898
Beck, John Godlove ..... 1899
Brack, Charles Emil ..... 1876
Brickman, Arthur Otto ..... 1898
Burrough, Horace ..... 1883
Burrough, Horace, Jr. ..... 1901
Caspari, Charles, Jr. ..... 1883
Caspari, William, Jr ..... 1898
Corning, Albion James ..... 1898
Culbreth, David Marvel Reynolds ..... 1883
Davis, John Alexander ..... 1894
Dohme, Alfred Robert Louis ..... 1891
DOHME, CHARLES EMILE ..... 1863
Dohme, Charles Louis ..... 1899
DOHME, LOUIS ..... 1859
Dunning, Henry Armitt Brown ..... 1902
ELLIOTT, HENRY ALEXANDER ..... 1859
EMICH, COLUMBUS VALENTINE ..... 1863
Feick, Charles ..... 1901
Foster, James Webb ..... 1902
Fouch, William M. ..... 1898
Frames, John Fuller ..... 1890
Gilpin, Henry Brooke ..... 1889
HANCOCK, JOHN FRANCIS ..... 1863
Hengst, John Edwin ..... 1900
Heiusler, Philip Ignatius ..... 1903
Hynson, Henry Parr ..... 1890
Kornmann, Henry ..... 1899
Maisch, Henry ..... 1898
Mansfield, Samuel ..... 1898
Meyer, Charles Louis ..... 1901
Millard, David Rockwell ..... 1899
Morgan, Charles ..... 1899
Muth, George Louis ..... 1894
Muth, John Clement ..... 1898
Muth, John Sebastian ..... 1898
Nattans, Arthur ..... 1883
Nordmann, Herman ..... 1895
Pilson, Abram Owen ..... 1898
Quandt, Arthur Albert ..... 1894
Quandt, Ernest Edmund ..... 1894
Richardson, Thomas Leonard ..... 1895
Schmidt, Charles ..... 1902
Schrader, August Christian ..... 1898
Schulze, Louis ..... 1892
Schumann, Otto George ..... 1902
*Sharp, Alpheus Phineas* ..... 1855
Simon, William ..... 1885
Smith, Theodoric ..... 1890
Streett, Edmund Oldfield ..... 1898
Stuart, William Alexander ..... 1898
Troxel, Henry Louis ..... 1902
Ware, Charles Howard ..... 1898
Westcott, James Walling ..... 1890
Williamson, Robert Edward Lee ..... 1898
WINKELMANN, JOHN HENRY ..... 1864

*Cumberland.*

Elderdice, William James. ..... 1902

*Hagerstown.*

Aughinbaugh, David Culbertson .....1898
Meredith Harry Lionel. .....1900
WINTER, JONAS.....1863

*Lonaconing.*

Campbell, George Dowery .....1900

*Snow Hill.*

Powell, William Cottingham .....1895

*Taneytown.*

McKinney, Robert Sentman.....1898

## MASSACHUSETTS.

*Boston.*

Baird, Julian William .....1894
Bassett, Charles Harrison .....1867
Boyden, Edward Cleveland.....1874
Burnham, Alfred Augustus, Jr.....1891
CANNING, HENRY.....1865
Capper, William Ernest .....1892
*Colton, James Byers* .....1865
Cramer, Max.....1881
*Doliber, Thomas* .....1859
DRURY, LINUS DANA.....1871
Durkee, William Carley .....1885
Godding, John Granville.....1875
Hayes, James Henry. .....1892
Jones, James Taber .....1875
Lauricella, Felice.....1896
Lewis, Ernest Grant.....1892
Lowd, John Colby .....1871
*Patton, Ichabod Bartlett* .....1858
Pfaff, Franz .....1899
Pierce, William Herbert .....1879
Sawyer, William Frederick.....1885
Scoville, Wilbur Lincoln.....1891
Sharples, Stephen Paschell. .....1875
SHEPPARD, SAMUEL AIRUS DARLINGTON. 1865
Small, Herbert Elwyn.....1901
Smith, Linville Holton. .....1892
Stowell, Daniel.....1875
Tilden, Amos Kendall.....1892
Tucker, Greenleaf Robinson .....1890
Vargas-Heredia, Jorge.....1891
Varney, Edward Francis.....1892
Wells, Edwin Herbert.....1893
West, Charles Alfred. .....1892
Wheeler, William Dexter. .....1892
Williams, George Gorham .....1888
WILSON, BENJAMIN OSGOOD .....1859
Wood, Edward Stickney.....1879

*Brockton.*

Randall, Frank Otis.....1893

*Cambridge.*

Chipman, Gilbert Swett .....1903
Claflin, Walter Addison .....1896
Phillips, Carrie Elizabeth .....1894
Seaverns, Martha Gilbert .....1902

*Cambridgeport.*

La Pierre, Elie Henry.....1892
Norton, George Edward .....1895
ORNE, JOEL STONE .....1859

*Charlestown.*

Cowan, John .....1897
STACEY, BENJAMIN FRANKLIN. .....1860

*Concord.*

Richardson, Horatio Stillman.....1892

*Dorchester.*

Day, Edward John .....1901

*Fall River.*

Riddell, Benjamin Franklin.....1892

*Fitchburg.*

Estabrook, Henry Arthur. .....1886

*Gloucester.*

Rogers, Anthony Charles .....1902

*Holyoke.*

Ball, Charles Ely .....1885
Heinritz, Lebrecht Gustav .....1902

*Jamaica Plain.*

Ernest, Frank Frederick.....1891
Markoe, George Burger .....1897

*Lawrence.*

Glover, William Henry.....1891

*Leominster.*

Nixon, Charles Frederic .....1900

*Lowell.*

Bailey, Frederick .....1869
Butler, Freeman Hall .....1874
Hood, Charles Ira .....1871
Thomasson. Anders.....1892

*Malden.*

Keaney, James John .....1899

*New Bedford.*

BLAKE, JAMES EDWIN.....1866
SHURTLEFF, ISRAEL HAMMOND.....1875

*Newburyport.*

Castlehun, Karl.....1902
Davis, Charles Leland.....1897
*Goodwin, William Wells*.....1853

*Newton.*

Crowdle, John Edward.....1894
Hudson, Arthur.....1882

*North Andover Depot.*

Perkins, George Henry.....1901

*Raynham.*

*Crossman, George Alvin*.....1872

*Salem.*

Nichols, Thomas Boyden.....1876
Price, Charles Henry.....1882
Price, Joseph.....1888

*Shelburne Falls.*

Baker, Edwin.....1875

*Stoneham.*

Drake, Frederick Townsley.....1894
Patch, Edward Leonard.....1872
Ward, Charles Abraham.....1891

*Worcester.*

Brewer, Howard Dickinson.....1902
Guerin, James Francis.....1898
Harris, Francis Mason.....1894
High, Raymond Lightcap.....1902
Scott, George Theodore.....1883

## MICHIGAN.

*Ann Arbor.*

Blome, Walter Henry.....1903
Calkins, Eleazer E.....1903
Eberbach, Ottmar.....1869
PRESCOTT, ALBERT BENJAMIN.....1871
Schlotterbeck, Julius Otto.....1888
Stevens, Alviso Burdette.....1885

*Berrien Springs.*

Kephart, Philip.....1902

*Big Rapids.*

Heath, George Millard.....1903

*Cadillac.*

Webber, Arthur H.....1903

*Coldwater.*

Lyon, Arthur George.....1903

*Corunna.*

Reidy, Michael.....1894

*Detroit.*

Allen, William Humphries.....1902
Burke, William Henry.....1902
Dillon, William Edmund.....1903
Doty, Wirt Payson.....1900
Famulener, Lemuel William.....1902
Greenthal, Julius.....1903
Hall, William Alanson.....1888
Helfman, Joseph.....1894
Houghton, Elijah Mark.....1899
Knox, James Wesley Thompson.....1898
Lyons, Albert Byron.....1885
MacFadden, Warren Lester.....1902
Mann, Charles Frederick.....1903
Mason, Harry Beckwith.....1896
Morris, Henry Michael.....1902
O'Connell, Charles John.....1903
Ohliger, Willard.....1903
Perry, Frederick William Riley.....1885
Ryan, Frank Gibbs.....1892
Seltzer, Leonard Adams.....1899
Stearns, Frederick.....1897
*Vernor, James*.....1866
Walker, Alfred Levi.....1903

*Flushing.*

Sprague, Wesson Gage.....1895

*Grand Rapids.*

Baert, George Henry.....1903
Beukema, James Alfred.....1903
Kirchgessner, William Carl.....1903
Muir, John Davidson.....1903
Peck, Percy Seaman.....1903
Schmidt, Walter Karl.....1903

*Ionia.*

Gundrum, George.....1882

*Kalamazoo.*

Todd, Albert May.....1885

*Monroe.*

Hagans, Daniel Allen.....1903

*Saginaw.*

Heim, Henry.....1900
Prall, Delbert Elwyn.....1902

MINNESOTA.

*Duluth.*

Abbett, William Allen.....1901
LeRicheux, Alfred Charles.....1901
*Sweeney, Robert Ormsby*.....1866

*Minneapolis.*

Allen, E. Floyd .....1885
Danek, John Francis .....1895
Gamble, Stewart .....1897
Huhn, George .....1884
King, George Alexander Newton .....1892
Thompson, Albert Delano .....1895
Wanous, Josephine Anna.....1897
Wittich, Matthew Henry .....1897
Wulling, Frederick John .....1893

*New Ulm.*

Eckstein, Andrew Joseph.....1895

*Ortonville.*

Nielson, John.....1897

*Pelican Rapids, Otter Tail Co.*

Axness, Ole Mikkelson.....1895

*St. Paul.*

Campbell, Albert Alexander.....1902
Collier, William Kelly .....1897
Conger, Frederic Albert.....1902
Dickman, Gustave Adolph.....1902
Drechsler, Frank Xavier.....1902
Frost, William Arthur.....1892
Hall, Alden Taylor .....1902
Heller, Charles Tompkins .....1895
Parker, Frederick M. .....1902
Reeves, Sidney Herbert .....1902
Zimmermann, Bernard.....1895

*Warren.*

Whitney, Edgar Francis.....1897

*Winona.*

Leeb, Theodore Feargod.....1903

MISSISSIPPI.

*Aberdeen, Monroe Co.*

*Eckford, Joseph William* .....1883

*Ellisville.*

Ward, Homer Benjamin.....1901

*Jackson.*

Hart, Joseph.....1901

*Kosciusko.*

Harvey, Wade.....1903

*Lumberton.*

Siebe, Henri Ozias.....1903

*Meridian.*

Bethea, Oscar Walter .....1902
Moore, Joshua Forrest.....1891

*Port Gibson.*

Shreve, John Alexander .....1880

MISSOURI.

*Boonville.*

Mittelbach, William.....1891

*Bunceton, Cooper Co.*

Kerns, William Bolton .... .....1901

*Carrollton.*

Knight, William Christian .....1900
PETTIT, HENRY MCEWEN.....1860

*Centralia.*

Hope, Robert Lee.....1901

*Excello, Macon Co.*

Powell, William David.....1898

*Excelsior Springs.*

Rowell, Samuel Jackson.....1903

*Jefferson City.*

Brandenberger, Adolph .....1894

*Joplin.*

Sterett, Walter Benjamin .....1903

*Kansas City.*

Breunert, August.....1901
Cary, Silas Brown.....1903
Crampton, Ferd Leslie..... .....1896
Eyssell, George .....1889
Federmann, William Martin.....1901
Griffiths, Joseph ..... .....1901
Hess, Paul Ludwig.....1892
Krueger, Owen William.....1897
Lawson, Charles Emil.....1903
Liersch, Clemens. .....1903
Mente, Alvin William.....1901
Mitchell, Francis Drake.....1903
Reymond, John Paul .....1903
Whitney, David Victory.....1903
Wirthman, John George.....1903

Wirthman, Joseph Charles.....1903
Zinn, Charles Edward.....1903

*Kirkwood.*

Hemm, Louis Phillips.....1894

*Mexico, Audrian Co.*

Llewellyn, John Frederick.....1867

*Nevada.*

Ballagh, Wilfred Thomas.....1901

*New Madrid.*

Hummel, John Andrew .....1901

*Plattsburg.*

Bowen, Cyrus West.....1901
Carmack, George Ward .....1903

*Sedalia.*

Bard, William Evans.....1901
Smith, Otis Wilmer.....1903

*St. Joseph.*

Pierce, Fred .....1903

*St. Louis.*

Ambrose, Olney Alphonso .....1903
Angermueller, William Frederick ....1903
Bartmer, Adolph Henry .....1901
Batt, Bruno.....1901
Bausch, Oscar Franz ... .....1903
Berryman, William Ellis.....1901
Blakeslee, Louis G.....1903
Blank, Alois .....1881
Boehm, Solomon .....1871
Boesewetter, Richard .....1902
Caspari, Charles Edward.....1902
Claus, Otto Ferdinand.....1901
Duering, Henry Charles .....1901
Elbrecht, Oscar Herman.....1901
Euler, Frederick Christopher .....1901
Falk, John Charles.....1900
Fischer, John Frederick Henry .....1901
Fishman, Casriel .....1903
Frerichs, Frederick William.....1901
Fricke, Frederick Henry.....1901
Friedewald, Hermann Wolfgang.....1901
Funsch, Oliver John .....1901
Good, James Michener .....1871
Grewe, Louis Frederick .....1901
Haffner, Jean Charles ..... ..1901
Hagee, William Price .....1901
Hagenow, Theodore Frederick .....1901
Hahn, Charles William John Henry..1901
Heinrich, Max Paul .....1901
Hemm, Francis .....1881
Hinrichs, Carl Gustav .....1901
Hinrichs, Gustavus Detlef .....1895
Ilhardt, William Kellermann .....1901
Ittner, William Frederick.....1903
Johnson, Fletcher Vernon .....1903
Judge, Charles Rogers.....1901
Kleinschmidt, Augustus Anton .....1903
Klie, Carl George Edward .....1903
Klie, George Henry Charles.....1878
Koeneke, Charles Henry.....1901
Lamar, William Robinson .....1901
Lamont, William Hamilton . .. ....1903
Layton, Thomas..... .....1892
Lester, Leon Thomas .....1903
Mallinckrodt, Edward.....1869
May, Charles Charlotte..... 1898
Merrell, George Robert.....1901
Merrell, Hubert Spencer..... .....1903
Merrem, Charles Daniel .....1901
Methudy, Joseph Peter .....1901
Meyer, Christian Fried. Gottlieb.1860
Meyer, Theodore Frederick .....1901
Milliken, John Thomas.....1901
Noll, Martin James .....1898
Pauley, Frank Charles..... .....1879
Pfeffer, William Joseph.....1901
Philibert, Leon David.....1901
Pilkington, William Bouldin .....1901
Pippert, Nicholas John.....1902
Reilly, Robert Charles.....1901
Riley, Russell.....1901
Sander, Enno.....1858
Scheffer, Henry William .....1863
Schoenthaler, John Paul.....1901
Seitz, Lorenz Aloysius.....1901
Sennewald, Emil August.....1900
Smith, George Wallace.....1901
Smith, James Atkinson.....1902
Spilker, Hermann Frederick Albert ..1901
Stegner, Emil.....1901
Stille, Adolph Herman .....1901
Stolle, Henry Jasper .....1903
Sultan, Frederick William .....1901
Temm, William Daniel.....1901
Tontz, George Washington.....1901
Uhlich, Ferdinand Gottlieb..... ..1881
Vitt, Rudolph Simon..... .....1895
Vordick, August Henry .....1874
Walbridge, Cyrus Packard .....1901

Wall, Otto Augustus .....1884
Wall, Otto Augustus, Jr.....1903
Weber, Peter John .....1901
West, Courtney Hughes ..... .....1902
WHELPLEY, HENRY MILTON .....1887
Whitcomb, Frederick Ezekiel.....1888
Wolf, Henry Adam .....1901
Wolff, Edward Henry .....1901
Wurmb, Theodore Henry.....1890

*Warrensburg.*

Sorency, Robert .....1903

*Washington.*

Gallenkamp, Edward William .....1903

*Webb City.*

Thomas, Frank W. .....1902
Wright, Charles Lewis.....1901

*Webster Groves, St. Louis Co.*

Mueller, Ambrose .....1894

*Windsor, Henry Co.*

Wesner, Henry Clay .....1901

## MONTANA.

*Butte.*

Rockefeller, Howard.....1900

*Forsyth.*

Wicks, Jesse Harrison.....1903

*Gilt Edge.*

Simmons, Gustav Tobias.....1903

## NEBRASKA.

*Auburn.*

Dort, Edward Harvey.....1903

*Beatrice.*

Harper, Harry Leroy .....1903

*Beaver City.*

Hopping, Charles Edward .....1903

*Fairbury.*

Pease, Autumn Vine .....1893

*Holdrege.*

Fink, Daniel Jacob .....1903

*Lincoln.*

Barth, Henry H. .....1901

*Norfolk.*

Grauel, Otto Henry.....1903

*Omaha.*

Kendall, John Lee. .....1903
Mares, Ferdinand Louis .....1897
Myers, Preston B.....1897
Ryerson, Maurice Walter.....1903
Schmidt, Joseph H. .....1897
Sherman, Charles Rollin.....1889

*Plattsmouth.*

Fricke, Frederick George .....1903

*St. Paul.*

Wilson, Elmer Lee .....1903

*Superior.*

Kendall, Wallace Warren. .....1903

## NEVADA.

*Elko.*

Taber, Joseph Milo .....1901

## NEW HAMPSHIRE.

*Berlin.*

Lyford, Earle Howard.....1903

*Dover.*

*Rollins, John Francis*.....1859

*Littleton.*

Robins, Wilbur Fiske .....1892

*New Market.*

*Dearborn, George Luther.* .....1853

*Portsmouth.*

Grace, William Day.....1896
Green, Benjamin .....1888
Preston, Andrew Peabody .....1881

*Somersworth.*

Hurd, John Charles .....1892
MOORE, GEORGE.....1859

*West Derry.*

Bell, Samuel Howard .....1890

## NEW JERSEY.

*Atlantic City.*

Deemer, George Morton Hays .....1902
Ridgway, William Frederick .....1902
Wescott, William Carter .....1896

*Bayonne.*

Peterson, John Nelson.....1902

*Bernardsville.*

Squibb, Charles Fellows.....1901

*Bordentown.*

Carslake, George Middleton.....1880

*Bridgeton.*

Dare, Charles Ford.....1889
Jorden, Henry Albert.....1902
Whipple, George Henry.....1902

*Camden.*

Barrett, Charles Llewellyn.....1902
Beringer, George Mahlon.....1893
Weiser, William Peiffer.....1902

*Chatham.*

Dougherty, Samuel Edward.....1875

*East Orange.*

Williams, Seward Whiting.....1887

*Elizabeth.*

FROHWEIN, RICHARD.....1867
Kent, Henry Avery Jr.....1880
Oliver, William Murray.....1875
Stutzlen, Frank Charles.....1902

*Englewood.*

Rockefeller, Lucius.....1880

*Freehold.*

Lehritter, George Peter.....1902
Walker, John Putnam.....1881

*Haddonfield.*

Willard, Rowland.....1902

*Hoboken.*

Brewer, Justin Sewall.....1903
KLUSSMANN, HERMANN.....1876

*Jersey City.*

*Abernethy, Maxwell*.....1865
Foulke, James.....1881
Gallagher, John Charles.....1893
Lohmann, Herman J.....1896
Stein, Edward Theodore North.....1902
Vockroth, Emil.....1893

*Jersey City Heights.*

Kuehne, Charles.....1902

*Keyport.*

Walling, Rufus Ogden.....1903
Warn, William Edgar.....1886

*Lakewood, Ocean Co.*

Harrison, William John.....1896

*Madison.*

Brown, William Thompson.....1894

*Matawan, Monmouth Co.*

Slater, Frank Hovey.....1882

*Medford.*

Thorn, Henry Prickett.....1879

*Montclair.*

Wrensch, Henry Ernest, Jr.....1902

*Morristown.*

CARRELL, EUGENE AYERS.....1875

*Newark.*

Betzler, Jacob.....1880
Coleman, John H.....1902
Eckert, John.....1902
Foster, John Benjamin.....1901
HOLZHAUER, CHARLES.....1873
Menk, Charles William.....1898
Smith, Clarence Pennington.....1890
Staehle, Louis Lorenz.....1898
Stamford, William Harrison.....1876
Van Winkle, Abraham.....1871
Wuensch, Charles.....1898

*New Brunswick.*

Kilmer, Frederick Barnett.....1886

*Orange.*

Sayre, Edward Augustus.....1877

*Perth Amboy.*

Parisen, George Warren.....1892

*Phillipsburg.*

Anewalt, Ellsworth Quincy.....1901

*Plainfield.*

*Ollif, James Henry*.....1867

*Red Bank.*

Van Derveer, Robert Hutchinson.....1903

*Riverside.*

Pine, Warren Carleton.....1897

*Shrewsbury.*

Hazard, Elmer Clarke.....1902

*South Amboy.*

JACQUES, GEORGE WASHINGTON .....1869

*Union.*

Neu, Daniel Alfred .....1903

*Verona, Essex Co.*

Rich, William Pitt.....1902

## NEW MEXICO.

*Fort Stanton.*

Maguire, Edward Sylvester.....1897
Morris, George Alexander .....1902

## NEW YORK.

*Albany.*

Bradley, Theodore James .....1896
Bradt, Warren Lansing.....1903
Dillenback, Garett Van der Veer ....1902
Gaus, Charles Henry.....1879
Huested, Alfred Birch.....1879
Michaelis, Gustavus.....1882
Walker, William John.....1880

*Auburn.*

Adams, Arthur Ellison .....1902

*Binghamton.*

Nelson, Burt Everett.....1902

*Brooklyn.*

Anderson, William Christine .....1900
Bartley, Elias Hudson.....1893
Brooks, George Washington .....1879
Brundage, Albert Harrison.....1892
Colen, James Austin .....1892
*DeForest, William Pendleton* .....1879
DeJonge, Cornelius .....1899
Dennin, Charles .....1875
Dennin, Edwin Clinton.....1892
Dewender, William Henry.....1896
Douglass, Henry .....1875
DUNN, JOHN AUGUSTUS .....1867
Eccles, Robert Gibson.....1885
Englander, Samuel .....1899
FOUGERA, EDMUND CHARLES HENRY.1890
Kleine, Oscar Clemens, Jr.....1903
Levy, Adolph .....1877
Lo Sardo, Antonino .....1902
Maass, William Frederick.....1903
May, Louis .....1902
McElhenie, Thomas DeArmond.....1872
McMahon, Joseph .....1897
OWENS, RICHARD JOHN .....1860
Post, Arthur Edward.....1901
Raubenheimer, Otto .....1902
Remington, Joseph Percy.....1901
Rosenzweig, Benjamin .....1898
Schaffer, Charles .....1903
Schmidt, Ferdinand Traugott.....1886
*Snyder, Ambrose Chancellor* .....1867
Squibb, Edward Hamilton .....1882
Tuthill, Frederic Percival .....1899
Waldner, Paul Jacob.....1900
Webber, Joseph LeRoy .....1886
Werner, Rudolph Carl .....1882

*Buffalo.*

Gregory, Willis George.....1886
Hayes, Horace Phillips.....1880
*Rano, Charles Orlando* .....1866
Reimann, George.....1902
Stoddard, Thomas ..... ....1900

*Catskill.*

Du Bois, William Laneman.....1880

*College Point.*

Hartz, Johann Daniel August.....1902

*Corning.*

Cole, Victor Le Roy..... .....1890

*Croton-on-Hudson.*

Henry, Charles (Dworniczak).....1881

*Dannemora.*

Sloss, Robert Audley.....1901

*Dunkirk.*

Davis, Eugene Miller .....1892

*Elmira.*

HOLMES, CLAYTON WOOD .....1873

*Fishkill-on-Hudson.*

*Moith, Augustus Theodore*.....1860

*Flushing.*

Hepburn, John.....1873

*Geneseo, Livingston Co.*

Rogers, Arthur Henry.....1882

*Groton.*

Rhodes, Charles Orman ..... .....1895

*Jamaica, Queens Co.*

Baylis, Lewis Fosdick....1880
Goodale, Harvey Galusha....1879
Peck, George Lyman....1883

*Middletown.*

KING, JAMES THEODORE....1859
Rogers, William Henry....1869

*Mount Vernon.*

Blackmore, Henry Spencer....1896
Rauschenberg, Sidney....1900
Stone, Clarence George....1901

*New York City.*

Allison, William Outis....1895
Alpers, William Charles....1890
Amend, Bernard Gottwald....1892
Aquaro, Joseph....1900
Balser, Gustavus....1875
Bigelow, Clarence Otis....1900
Billings, Henry Merry....1869
Boeddiker, Otto....1895
Brucker, Carl Friederich Jacob....1902
CHANDLER, CHARLES FREDERIC....1867
Coblentz, Virgil....1882
Cook, Thomas Penrose....1877
Daggett, Volney Chapin....1901
Diekman, George Charles....1898
Eaton, Harvey K....1902
Faber, Walter Eberhard....1900
Fairchild, Benjamin Thomas....1875
Fairchild, Samuel William....1887
Fraser, Horatio Nelson....1888
Gable, Ralph Benton....1902
Gahn, Henry....1902
Gane, Eustace Harold....1895
GARDNER, ROBERT WINSLOW....1867
Geisler, Joseph Frank....1889
Goldman, Oscar....1900
Gregorius, George Gustavus Chas. Wm.1898
Haddad, Saleem Faris....1902
Hauenstein, William....1883
Haynes, David Oliphant....1887
HEYDENREICH, EMILE....1867
Hirseman, Felix....1900
Hitchcock, George Henry....1902
Hopkins, Jesse L....1898
Hudnut, Richard Alexander....1899
Jelliffe, Smith Ely....1895
Jungmann, Julius....1879
Kalish, Julius....1875
Kalish, Oscar G....1900
Keenan, Thomas John....1894
Kemp, Edward....1903
Kennedy, Ezra Joseph....1887
*Kent, Robert Restieaux*....1855
Kirchgasser, William Charles....1888
Lampa, Robert Raymond....1892
Lascoff, Jacob Leon....1903
Lovis, Henry Christian....1892
MAIN, THOMAS FRANCIS....1872
Mariamson, Max....1902
Mayo, Caswell Armstrong....1893
McIntyre, Ewen....1873
McIntyre, Ewen, Jr....1903
McKesson, George Clinton....1888
MCKESSON, JOHN, JR....1867
Miller, Herman....1897
*Molwitz, Ernest*....1867
Murray, Benjamin Lindley....1896
Niece, Frederic Ellwood....1903
O'Neil, Henry Maurice....1879
Parsons, Charles West....1899
Pennock, Edward....1898
Plaut, Albert....1894
Pringle, James Maxwell....1902
Quackinbush, Benjamin Franklin....1886
RAMSPERGER, GUSTAVUS....1860
Reynolds, Charles Edward....1897
Robinson, William Josephus Marir....1902
RUNYON, EDWARD WHEELOCK....1875
Rusby, Henry Hurd....1890
Schenck, Henry....1903
Schieffelin, William J....1892
Schimpf, Henry William....1894
Schleussner, Charles Frederick....1902
Schmid, Henry....1887
SEABURY, GEORGE JOHN....1876
Sieker, Ferdinand August....1893
SKELLY, JAMES JOSEPH....1866
Smith, Reuben Randolph....1890
Stearns, William Lincoln....1903
Stewart, Aaron Walter....1902
Swann, Samuel Van Buren....1903
Takamine, Jokichi....1898
White, Charles Hugh....1902
Wichelns, Frederick....1881
Wickham, William Hull....1870
Wolff, Gustave....1903

*Oswego.*

Butler, Charles Henry....1887

*Plattsburg.*

Hitchcock, John E....1892

*Richfield Springs.*

Smith, Willard Alfred ..... 1880

*Saratoga Springs.*

FISH, CHARLES FREDERICK ..... 1866

*Stapleton, Staten Island.*

Roehrig, Albert Michael ..... 1902

*Syracuse.*

Dawson, Edward Seymour, Jr. ..... 1876
Muench, William ..... 1899
Snow, Charles Wesley ..... 1876

*Utica.*

Blaikie, William ..... 1879
Watson, William, Jr. ..... 1902

*Wellsville, Allegany Co.*

Hall, Edwin Bradford ..... 1879

*Yonkers.*

Petsche, Franz Fried. Bismarck Wilhelm. 1892

## NORTH CAROLINA.

*Asheville.*

Pfafflin, Henry Adolph ..... 1892
Smith, Whitefoord Gamewell ..... 1892

*Chapel Hill.*

Howell, Edward Vernon ..... 1900

*Charlotte.*

Williams, Morrison Patton ..... 1902

*Durham, Orange Co.*

Vaughan, Parry Wyche ..... 1882

*Fayetteville.*

Horne, Warren Winslow ..... 1902

*Morganton.*

Leslie, William Augustus ..... 1902

*New Bern.*

Bradham, Caleb Davis ..... 1902

*Raleigh.*

Simpson, William ..... 1873

*Scotland Neck.*

Whitehead, Eugene Thomas ..... 1900

*Tarboro.*

Macnair, Whitmel Horne ..... 1898
ZOELLER, EDWARD VICTOR ..... 1878

*Wilmington.*

Hardin, John Haywood ..... 1881

## NORTH DAKOTA.

*Devil's Lake.*

Hodgkinson, Albert Edgar ..... 1903

*Erdmore.*

Simenstad, Martin O. ..... 1903

*Jamestown.*

White, Herbert Eugene ..... 1897

*Lakota.*

St. John, Sydney Sylvester ..... 1897

## OHIO.

*Cambridge.*

Ogier, John Morrison ..... 1895

*Canton.*

Roth, Charles Robert ..... 1900

*Chillicothe.*

Howson, Arthur Bayshawe ..... 1886

*Cincinnati.*

Cone, Earl Hobart ..... 1901
DeLang, Alfred ..... 1887
Fennel, Charles Theodore Piderit .... 1886
Fieber, Gustavus Adolphus ..... 1893
French, Rolland Hall ..... 1903
*Gordon, William John Maclester* ... 1854
Greyer, Julius ..... 1880
LLOYD, JOHN URI ..... 1870
Merrell, Charles George ..... 1888
Merrell, George ..... 1879
Pursel, Robert Clayton ..... 1902
Rogers, Edward ..... 1902
Ruppert, John ..... 1880
Serodino, Herman ..... 1880
Simonson, William ..... 1887
Wetterstroem, Albert Frederick Charles. 1888
Wetterstroem, Theodore David ... ..1897
YORSTON, MATTHEW MACKAY ..... 1864
Zuenkeler, John Ferdinand ..... 1887

*Cleveland.*

Arny, Harry Vin ..... 1891
Bauer, Jonathan Melanchthon ..... 1903
Benfield, Charles William ..... 1893
Brown, Charles Malvern ..... 1902
Cobb, Ralph Lathrop ..... 1883

Drach, George Louis....1902
Drake, Wallace Clinton....1902
English, George Elbert....1903
Feil, Joseph....1885
Firth, Samuel Sol....1903
Fischer, Henry John....1902
Fox, Willard Milton....1903
Gleim, John Christopher....1893
Haake, William Henry....1893
Hankey, William Tabor....1902
Hannan, Owen Burdette....1893
Hechler, George Lewis....1882
Herold, Lodimir....1903
Hopp, Lewis Christopher....1876
Johns, William George....1902
Krause, John....1900
Kuder, William Frank....1893
Lehr, Philip....1885
McKenzie, Hugh Hamilton....1902
Miller, Frederick John....1902
Mitermiler, John Alfred....1903
Myers, Daniel....1882
Oertel, Alfred Augustus....1903
Oster, Frank Charles....1902
Placak, Harry....1902
Schoenhut, Christian Henry....1888
Selzer, Eugene Reinhold....1893
Sherwood, Henry Jackson....1894
Sords, Thomas Vincent....1893
Voss, George William....1885

*Columbiana.*

Ink, Charles Eliott....1885

*Columbus.*

Bruck, Philip Henry....1884
Byrne, John....1893
Dye, Clair Albert....1901
Haney, Thomas Carlyle....1903
Hatton, Edgar Melville....1878
Hatton, Ellmore Wright....1894
Huston, Charles....1872
Kaemmerer, William Frederick....1899
Kauffman, George Beecher....1882
Matson, George Hiram, Jr....1869
Ogier, William Robert....1901
Rauschkolb, John....1894
Schueller, Frederick William....1880
Wendt, William Carl....1901

*Conneaut, Ashtabula Co.*

Symonds, Arthur Henry....1892

*Dayton.*

Burkhardt, Mark Anthony....1887

*Delphos.*

King, Ferdinand Henry....1901

*Elyria.*

Eckler, Charles Ralph....1903

*Findlay.*

Firmin, John Curtis....1893

*Grand Rapids, Wood Co.*

Thurston, Azor....1886

*Hillsboro.*

Garrett, Oscar Newton....1902

*Logan.*

*Harrington, Frank*....1869

*Magnolia.*

McIlravy, Maude Jeanette....1903

*Navarre.*

Grossklauss, John Ferdinand....1859

*Scio.*

Beal, James Hartley....1892
Creighton, Mary Louisa....1903

*Springfield.*

Casper, Thomas Jefferson....1867
Siegenthaler, Harvey Newton....1882

*Wooster.*

Ohliger, Louis Philip....1871

*Youngstown.*

Cassaday, Orlin Ulysses....1899

## OKLAHOMA TERRITORY.

*Guthrie.*

Lillie, Foress Ball....1900

*Hennesey.*

Dinkler, Frank A....1900

*Jones City.*

Stone, Sarah Effie....1903

*Norman.*

Seymour, James....1903

*Oklahoma City.*

Weaver, Francis Marion....1900

*Stroud.*

Burton, John Clement.....1902

*Yukon.*

Jeffers, Clyde Norman.....1903
Settle, James Albert.....1903

OREGON.

*Ashland, Jackson Co.*

McNair, John Seydenham .....1902

*Marshfield.*

Brown, James Lee .....1903

*Portland.*

Blumauer, Louis.....1889
Robertson, Felix Otey.....1890

*The Dalles.*

Blakeley, George Clarence.....1892

PENNSYLVANIA.

*Allegheny City.*

Caldwell, Joseph France.....1902
Einstein, Morris.....1900
Minnick, William George.....1902

*Beaver, Beaver Co.*

Andriessen, Hugo .....1875

*Braddock.*

Hollander, Joseph Maurice .....1901

*Butler.*

Boyd, Charles Newton.....1900

*Carlisle.*

Horn, Wilbur Fisk .....1876

*Connellsville.*

Berryhill, Henry Pennick.....1890

*Du Bois.*

Hay, Charles La Mar .....1898

*Easton.*

Anspach, Paul Bucher.....1903
Semple, Henry Beddleman, Jr.....1903

*Girardsville.*

Donaghue, James.....1900
Donaghue, Theresa Veronica.....1900

*Harrisburg.*

GEORGE, CHARLES THEODORE .....1873
Gorgas, George Albert.....1884
Gross, Edward Ziegler.....1883
Miller, Jacob Augustus .....1873
Smith, Benjamin Franklin .....1892

*Haverford.*

Harbaugh, James Duncan .....1902
Harbaugh, Wilson Linn .....1896

*Johnstown.*

Griffith, Charles .....1900
Young, Charles.....1902

*Lancaster.*

Frailey, William Otterbein.....1903
Heinitsh, Sigmund William.....1889

*Langhorne.*

Hancock, Charles West .....1868

*Lansford, Carbon Co.*

Renshaw, Thomas Worthington.....1901

*Lebanon.*

LEMBERGER, JOSEPH LYON.....1858
Redsecker, Jacob Henry.....1881

*Manheim, Lancaster Co.*

Ruhl, Harry Fry .....1902

*McKeesport.*

Rodemoyer, William Edward.....1901

*Mt. Joy, Lancaster Co.*

Garber, Elmer Franklin Weaver .....1901

*New Castle.*

Haley, John B.....1902

*Norristown.*

Reed, Willoughby Henry.....1893

*Philadelphia.*

Baer, Jacob Michael .....1902
Bamford, Melvin William.....1901
BAUER, LOUIS GUSTAVUS .....1867
Billetdoux, Chester Augustus .....1903
Borell, Henry Augustus.....1874
BORING, EDWARD MCCURDY .....1867
Burg, John Dellinger .....1888
Busch, Miers.....1903
Campbell, Milton.....1902
Campbell, Theodore .....1902
Civins, Albert Isaac.....1902
Cliffe, William Lincoln.....1898
Cook, Ernest Fullerton .....1901

Crawford, Joseph....1903
DOBBINS, EDWARDS TOMPKINS....1867
Donnel, Cornelius Philip....1902
Douglas, John North....1903
Eigelberner, Harry Brittain....1902
*Ellis, Evan Tyson*....1857
England, Joseph Winters....1893
Eppstein, Jacob....1902
Evans, George Bryan....1902
Feidt, George David....1898
Fenner, Harvey Albert....1902
Fox, Peter Paul....1869
French, Harry Banks....1890
Gano, William Hubbell....1892
Graham, Willard....1902
Hance, Anthony Miskey....1902
HANCE, EDWARD HANCE....1857
Hassinger, Samuel Ellphat Reed....1880
Haussmann, Frederick William....1895
Haydock, Mabelle....1902
Heim, William Joseph....1902
*Heintzelman, Joseph Augustus*....1858
Hoch, Aquilla....1896
Hughes, Francis Stacker....1902
*Jenks, William Jenks*....1858
Jones, Alexander Henry....1874
Keeney, Caleb Reynolds....1868
Kline, Clarence Mahlon....1902
Kline, Mahlon Norwood....1878
Koch, Louis....1872
KRAEMER, HENRY....1892
Krewson, William Egbert....1875
LaWall, Charles Herbert....1896
Leedom, Charles....1902
Lowe, Clement Belton....1895
Matusow, Harry....1897
McIntyre, William....1868
*Mellor, Alfred*....1864
Mentzer, Harvey H....1902
MILLER, ADOLPHUS WILLIAM....1868
MILLIGAN, DECATUR....1867
Moerk, Frank Xavier....1898
Monaghan, Thomas Francis....1902
MOORE, JOACHIM BRICKLEY....1860
MORRIS, LEMUEL IORWERTH....1880
Mulford, Henry Kendall....1896
Oetinger, Albert....1902
Osterlund, Otto William....1902
Ottinger, James Jeremiah....1876
Peacock, Bertha Leon (Mrs.)....1895
Peacock, Josiah Comegys....1892
Pile, Gustavus....1881
Potts, David Gardner....1893
REMINGTON, JOSEPH PRICE....1867
*Rittenhouse, Henry Norman*....1857
Rosengarten, George David....1902
Sadtler, Samuel Philip....1893
Shafer, Erwin Clement....1893
SHINN, JAMES THORNTON....1860
Shoemaker, Clayton French....1902
SHOEMAKER, RICHARD MARTIN....1865
Smith, Albert Henry....1902
Smith, Walter Valentine....1902
Sprissler, Clara....1902
Stroup, Freeman Preston....1900
Swain, Harry....1902
*Thompson, William Beatty*....1858
Vanderkleed, Charles Edwin....1902
Warner, William Richard, Jr....1902
Webb, William Henry....1867
Weidemann, Charles Alexander....1868
Weidemann, George Buzby....1902
Wendel, Henry Edward....1873
*Wiegand, Thomas Snowden*....1857
Wilbert, Martin Inventius....1902
Wolcott, Abraham Lincoln....1903

*Pittsburg.*

Emanuel, Louis....1878
Gettel, John Ralph Elsrode....1902
Gleghorn, James Seymour....1900
Judd, Albert Floyd....1901
Koch, Julius Arnold....1892
Schaeffer, Emil August....1900

*Pottstown.*

Byers, Huizinga Clarence....1900

*Pottsville.*

Diebert, Thomas Irwin....1882

*Reading.*

Stein, Jacob Henry....1902
ZIEGLER, PHILIP MILTON....1867

*Robesonia.*

Moyer, Lewis Nathan....1903

*Scranton.*

Davies, John Jenkins....1902
Doersam, Philip, Jr....1903
Thomas, Daniel Judson....1900

*Sharpsburg.*

Patrick, Elmer Alcorn....1900

*Swissvala.*

Johnson, Ralph Henry....1901

*Towanda.*

PORTER, HENRY CARROLL.....1872

*West Chester.*

Evans, Joseph Spragg.....1877

*Williamsport.*

Cornell, Edward Augustus .....1873
Smith, Edward W.....1902

*York.*

Alexander, Charles Ellis.....1899
Boyd, Guy Stephen .....1903
Patton, John Franklin.....1880
Smith, Jacob Schall.....1903
Weakley, William Stair. .....1902

## RHODE ISLAND.

*Narragansett Pier.*

Tobin, John Martin.....1887

*Newport.*

Downing, Benjamin Franklin, Jr.....1886
Pearson, Joseph Frederick.....1897
Wood, John William.....1897

*Providence.*

Blanding, William Oliver. .....1894
Cone, John Wright .....1876
Crawford, Frank Eugene.....1902
Daggett, Charles Henry .....1902
Greene, William Ray.....1883
Lyon, George Calvin.....1899
O'Hare, James.....1888
Pearce, Howard Anthony.....1894

*Westerly.*

Collins, Albert Burlingame.....1882
Collins, Mary Elizabeth.....1902

*Woonsocket.*

Jackson, Frank Anthony.....1900
Simmons, Frank Birtles.....1897

## SOUTH CAROLINA.

*Camden.*

Zemp, William Robinson.....1900

*Charleston.*

Aimar, Charles Pons .....1879
Smith, Francis Marion.....1902
Speissegger, Walter Louis.....1902

*Gaffney.*

Cureton, George Douglas .....1902

*Greenville.*

Carpenter, Alfred Baxter .....1898

*Seneca.*

Lunney, William John.....1902

## SOUTH DAKOTA.

*Bristol.*

Mack, George Christian .....1902

*Brookings.*

Cornell, Edward Cloyer.....1902
Tidball, James Taylor.....1902

*Gayville.*

Fulton, Peter MacMullen.....1902

*Madison.*

Schutz, Chris..... .....1902

*Wakonda.*

Gilchrist, Nellis Remer.....1901

*Watertown.*

Jones, David Franklin.....1895

*Yankton.*

Brecht. Frederick Adolph.....1895

## TENNESSEE.

*Bell Buckle.*

Trolinger, Ernest Franklin .....1903

*Chattanooga.*

Greve, Charles Mathias.....1887
Voight, Joseph Frederick.....1893

*Columbia.*

Rains, Aris Brown.....1894

*Humboldt.*

Thweatt, Archibald .....1900

*Knoxville.*

Rosenthal, David Abraham.....1894

*Memphis.*

ROBINSON, JAMES SCOTT.....1869

*Nashville.*

McGill, John Thomas .....1900
Ruddiman, Edsel Alexander.....1894
Shwab, George Augustus.....1901

TEXAS.

*Austin.*

Neville, William Rust ..... 1901

*Dallas.*

De Lorenzi, Albert ..... 1890
Eberle, Eugene Gustavus ..... 1896

*Forney.*

Adams, Frank Milton ..... 1903

*Galveston.*

Cline, Raoul Réné Danniel ..... 1898
Orton, Ingomar François ..... 1891

*Hearne.*

Hazlett, James Lupe ..... 1900

*Houston.*

Burgheim, Jacob ..... 1892
Hoffman, Herman ..... 1902

*Jacksonville.*

Johnson, Ambrose ..... 1903

*Longview.*

Hamilton, Clarence Barnett ..... 1903
Sims, Henry Upson ..... 1903

*Marshall.*

Richardson, Edwin Sexton ..... 1902

*McKinney, Callin Co.*

Dulaney, Joseph Field ..... 1902

*San Antonio.*

Schmitt, George Joseph Francis ..... 1890

*Taylor.*

Thames, Joseph Jefferson ..... 1895

*Terrell.*

Schrodt, Jacob ..... 1903

*Troupe.*

McKay, Felix Early ..... 1903

*Velasco.*

Roeller, Edward Frank ..... 1902

*Waelder, Gonzales Co.*

Brookes, Virginia Cade ..... 1901

UTAH.

*Salt Lake City.*

Irvine, Darwin William ..... 1902

VERMONT.

*Brandon.*

Hopkins, Zerah Blaisdell ..... 1900

*Burlington.*

Zottman, William Henry ..... 1903

*Montpelier.*

Blakely, Collins ..... 1899
Poole, William Everett ..... 1902
Slade, Harry Allen ..... 1899
Terrill, Willis Ethel ..... 1899

*Northfield.*

Dunham, Andrew Allen ..... 1901

*St. Albans.*

Dutcher, Alfred Luther ..... 1892

*St. Johnsbury.*

Bingham, Charles Calvin ..... 1875

VIRGINIA.

*Lynchburg.*

Goldsborough, Charles Henry ..... 1898

*Newport News.*

Congdon, George Gardner ..... 1903
Klor, Alexander Edward George ..... 1899

*Norfolk.*

MacRae, John Young ..... 1894
May, Edward ..... 1897
McLarty, Colin ..... 1898

*Pamplin City, Appomattox Co.*

Walker, Emmett Edward ..... 1900

*Richmond.*

Baker, Thomas Roberts ..... 1856
Barksdale, George Edwards ..... 1900
Benson, John Meade ..... 1903
Briggs, Andrew Gessner ..... 1890
Harrison, Robert Lucius ..... 1900
Miller, Turner Ashby ..... 1894
Reade, Frank Marshall ..... 1900
Scott, William Henry ..... 1873

*Suffolk.*

Hall, Joseph Patten ..... 1900

WASHINGTON.

*La Conner, Skagit Co.*

Joergensen, Gerhard Johan Carl Sophus. 1889

*Port Townsend.*

Troxler, Robert Fulton ..... 1902

*Pullman.*

Watt, George Henry ..... 1896

*Seattle.*

Bolink, Elebertus ..... 1902
Bories, Emil ..... 1902
Holmes, Henry Elliott ..... 1880
Johnson, Charles Willis ..... 1903

*Snohomish.*

Wilbur, Lot ..... 1896

*Tacoma.*

Gamer, Albert Charles C ..... 1902
Osseward, Cornelius ..... 1897

WEST VIRGINIA.

*Wellsburg.*

Buchanan, Clark Gambrill ..... 1903

WISCONSIN.

*Eau Claire.*

Boberg, Otto Johan Sinius ..... 1903

*Janesville.*

VOISS, ARCADIUS ..... 1901

*La Crosse.*

Beyschlag, Charles ..... 1880

*Madison.*

Brandel, Irvin Walter ..... 1903
Fischer, Richard ..... 1901
Kremers, Edward ..... 1887

*Mayville, Dodge Co.*

Sauerhering, Edward ..... 1903
Sauerhering, Rudolph Aurelius ..... 1884

*Milwaukee.*

Dadd, Robert Morrow ..... 1896
Dietz, Emil ..... 1903
DRAKE, JOHN RANSOM ..... 1860
Janssen, Jacob Solomon ..... 1903
Kettler, Edward, Jr ..... 1896
Kienth, Hans ..... 1884
Krembs, Ernest Maximilian ..... 1903
Mieding, Albert Edward ..... 1903
Raeuber, Edward Gottfried ..... 1900
Ruenzel, Henry Gottlieb ..... 1892
Schrank, Charles Henry ..... 1876

*Neillsville.*

Sniteman, Charles Clarence ..... 1881

*Oconomowoc.*

Peters, Henry August ..... 1903

*Superior.*

Herb, Joseph ..... 1903

*Watertown.*

Eberle, Herman Theodore ..... 1901

## DOMINION OF CANADA.

NEW BRUNSWICK.

*St. John.*

Paddock, Morris Venner ..... 1902

NOVA SCOTIA.

*Halifax.*

Simson, Francis Cook ..... 1876

ONTARIO.

*Hamilton.*

Clark, John Alexander ..... 1890

*Harrow.*

Darby, Edmund Feilde ..... 1903

*Orangeville.*

Turner, Adam ..... 1902

*Ottawa.*

SAUNDERS, WILLIAM ..... 1860

*Parkhill.*

Roberts, James Frederick ..... 1901

*Pictou.*

Case, Edmund Wendall ..... 1901

*Stratford.*

WAUGH, GEORGE JAMES ..... 1862

*Toronto.*

Gibbard, George Eakins ..... 1902
Heebner, Charles Frederick ..... 1894

*Windsor.*

D'Avignon, John Eugene ..... 1888

QUEBEC.

*Montreal.*

Baridon, Louis Richard....1890
Gray, Henry Robert....1867
Lachance, Seraphin....1888
Morrison, Joseph Edward....1888
Vadboncoeur, Louis Joseph Edmond..1903

*Quebec.*

Willis, Henry....1897

*St. Hyacinthe.*

St. Jacques, Gaston....1900

*Three Rivers.*

Williams, Richard Wellington....1883

## MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Bowen, William Africanus, Mombasa, British East Africa....1897
*Heyl, James Bell*, Hamilton, Bermuda....1863
Holsendorf, Benjamin Ellis, Havana, Cuba....1902
Jacobs, Charles Christian, Constancia, Cienfuegos, Cuba....1901
Martin, Nicholas Henry, Gateshead-on-Tyne, England....1891
Murray, Alexander, San Jose de Costa Rica....1903
Ortiz, Miguel Alvarez, Havana, Cuba....1902
Patch, James Alfred, Beirût, Syria....1903
Pirie, Alfred Mitchell, Cartago, Costa Rica....1903
Power, Frederick Belding, London, England....1872
Wellcome, Henry Solomon, London, England....1875

## MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Appelbaum, Jerome....1902
Brown, William Ambrose....1893
Craig, William Preston....1901
Daly, James Edward....1902
Hansen, Hans....1901
Hinton, Rufus Gray....1901
Kosminsky, Leonce Joe....1902
Mayo, Frederick William....1901

Note.—Names of life members whose residence has been unknown for five consecutive years, are no longer published in the above list, in accordance with the action of the Council approved at the forty-eighth annual meeting. (See Proceedings, 1900, p. 18.)

# ALPHABETICAL LIST OF MEMBERS.

## HONORARY MEMBERS.

Attfield, Dr. John, F. R. S., Watford, England.
Carteighe, Michael, F. I. C., 180 New Bond St., London, W., England.
Hoffmann, Dr. Frederick, Schlüter Strasse 64, Charlottenburg, Berlin, Germany.
Holmes. E. M., F. L. S., 17 Bloomsbury Square, London, W. C., England.
Hooper, David, F. I. C., F. C. S., Indian Museum, 1 Sudder St., Calcutta, India.
Ince, Joseph, F. L. S., Glenholme, 13 Alfred Road, Acton, W., London, England
Martenson, Staatsrath J. von, Kinderhospital des Prinzen von Oldenburg, St. Petersburg, Russia.
Schacht, Dr. Karl, 56 Mittelstrasse, Berlin, N. W., Germany.
Schaer, Dr. Edward, Professor of Pharmacy, Pharmaceutisches Institut der Universität, Strassburg, Germany.
Schmidt, Professor Dr. Ernst, Geh. Regierungsrath, Marburg, Germany.

# ACTIVE MEMBERS.

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Abbett, William A.,
201 W. Superior st., Duluth, Minn.
*Abernethy, Maxwell,*
188 Newark ave., Jersey City, N. J.
Adamick, Gustave H.,
189 E. Madison st., Chicago, Ill.
Adams, Arthur E.,
16 Westlake ave., Auburn, N. Y.
Adams, Frank M.,
Forney, Tex.
Aimar, Charles P.,
411 King st., Charleston, S. C.
Allen, E. Floyd,
1538 Nicollet ave., Minneapolis, Minn.
Allen, Grafton C.,
U. S. P. H. & M. H. S., New Orleans, La.
Allen, William H.,
307 Trumball ave., Detroit, Mich.
Alexander, Chas. E.,
961 N. George st., York, Pa.
Allison, William O.,
100 William st., New York, N. Y.
Alpers, William C.,
45 W. 31st st., New York, N. Y.
Ambrose, Olney A.,
932 Beach ave., St. Louis, Mo.
Amend, Bernard G.,
205 3d ave., New York, N. Y.
Anderson, Rudolph J.,
1403 Annunciation st., New Orleans, La.
Anderson, Samuel,
48 Front st., Bath, Me.
Anderson, Wm. C.,
320 Lafayette ave., Brooklyn, N. Y.
Andreen, Carl,
1504 4th st., Sioux City, Ia.
Andriessen, Hugo,
P. O. Box 57, Beaver, Beaver Co., Pa.
Anewalt, Ellsworth Q.,
142 S. Main st., Phillipsburg, N. J.
Angermueller, William F.,
1201 Chouteau ave., St. Louis, Mo.
Anglum, John,
1463 Larimer st., Denver, Colo.
Anspach, Paul B.,
334-336 Northampton st., Easton, Pa.
Appelbaum, Jerome,
Residence unknown.
Appleton, William R.,
El Dorado, Ark.
Aquaro, Joseph,
202 Spring st., New York, N. Y.
Arnett, William N.,
22 W. Washington st., Indianapolis, Ind.
Arny, Harry V.,
356 Superior st., Cleveland, O.
Aughinbaugh, David C.,
54 W. Washington st., Hagerstown, Md.
Averill, William H.,
435 Main st, Frankfort, Ky.
Axness, Ole M.,
Pelican Rapids, Otter Tail Co., Minn.
Baer, Jacob M.,
1400 Spruce st., Philadelphia, Pa.
Baert, George H.,
141 Jefferson ave., Grand Rapids, Mich.
Bailey, Frederick,
P. O. Box 314, Lowell, Mass.
Baird, Julian W.,
102 St. Botolph st., Boston, Mass.
Baker, Edwin,
Bridge st., Shelburne Falls, Mass.
Baker, Howard S.,
509 4th st., Sioux City, Ia.
Baker, T. Roberts,
Cor. Lester & Ash sts., Richmond, Va

Balkcom, Victor F.,
26 Monroe st., Tallahassee, Fla.
Ball, Charles E.,
227 High st., Holyoke, Mass.
Ballagh, Wilfred T.,
S. E. cor. Square, Nevada, Mo.
BALLARD, JOHN W.,
106 W. 2d st., Davenport, Ia.
Balser, Gustavus,
137 Avenue B, New York, N. Y.
Bamford, Melvin W.,
1827 Pacific st., Tioga, Philad'a, Pa.
Barbat, Josephine E. (Miss),
1310 Folsom st., San Francisco, Cal.
Bard, William E.,
108 W. Main st., Sedalia, Mo.
Baridon, Louis R.,
1703 St. Catharine st., Montreal, Can.
Barksdale, George E.,
3900½ Williamsburg ave., Richmond, Va.
Barnett, Joel J.,
c. o. Sharp & Dohme, Baltimore, Md.
Barrett, Chas. L.,
601 Berkley st, Camden, N. J.
Bartells, George C.,
130 East State st., Camp Point, Ill.
Barth, Geo. F.,
State st., North Alton, Ill.
Barth, Henry H.,
929 O st., Lincoln, Neb.
*Bartlett, N. Gray,*
22d st. & Indiana ave., Chicago, Ill.
Bartley, Elias H.,
21 Lafayette ave., Brooklyn, N. Y.
Bartmer, Adolph H.,
3180 Easton ave., St. Louis, Mo.
Base, Daniel,
329 N. Schroeder st., Baltimore, Md.
Bassett, Charles H.,
109 Arch st., Boston, Mass.
Bastian, Otto C.,
129 W. Washington st., South Bend, Ind.
Batt, Bruno,
3803 Flad ave., St. Louis, Mo.
Batt, Hermann,
52 Dearborn st., Chicago, Ill.
Battle, Orrin McR.,
Hope, Ark.
Bauer, Jonathan M.,
Payne ave. & Huntington st., Cleveland, O.
BAUER, LOUIS G.,
333 Fairmount ave., Philadelphia, Pa.
Baur, Jacob,
76 Illinois st., Chicago, Ill.
Bausch, Oscar F.,
613 Century Bldg., St. Louis, Mo.
Baylis, Lewis F.,
388 Fulton st., Jamaica, Queens Co., N. Y.
Bayly, Charles A.,
Grant ave. & Sutter st., San Francisco, Cal.
Beal, James H.,
Scio, O.
Beck, Henry M.,
246 Sutter st., San Francisco, Cal.
Beck, John G.,
1538 N. Caroline st., Baltimore, Md.
Becker, Charles L.,
304 Main st., Ottawa, Kan.
Behrens, Emil C. L.,
807 S. Halstead st., Chicago, Ill.
Beitenman, William W.,
2d st. & Bennett ave., Cripple Creek, Colo.
Bell, Emil R.,
Preston & Breckenridge sts., Louisville, Ky.
Bell, S. Howard,
West Derry, N. H.
Benfield, Charles W.,
Wilson & Payne aves., Cleveland, O.
Benson, John M.,
26 W. Leigh st., Richmond, Va.
Benton, Wilber M.,
325 Main st., Peoria, Ill.
Berger, Ernest,
P. O. Box 566, Tampa, Fla.
Beringer, George M.,
501 Federal st., Camden, N. J.
Berner, Carl A.,
cor. 16th st. & Grand ave., Des Moines, Ia.
Bernstein, Michel,
Texas ave. & Murphy st., Shreveport, La.
Berry, Robert H.,
Main st., Cynthiana, Ky.
Berryhill, Henry P.,
Buttermore Block, Connellsville, Pa.
Berryman, William E.,
Union Station, St. Louis, Mo.
*Best, John,*
1 German Block, Central City, Colo.
Bethea, Oscar W.,
4th st. & 22d ave., Meridian, Miss.
Betzler, Jacob,
593 Orange st., Newark, N. J.
Beukema, James A.
129–131 Monroe st., Grand Rapids, Mich.

Beyschlag, Charles,
503 Main st., La Crosse, Wis.
Bigelow, Clarence O.,
102 Sixth ave., New York, N. Y.
Billetdoux, Chester A.,
cor. 17th & Ritner sts., Philadelphia, Pa.
Billings, Henry M.,
28 W. 50th st., New York, N. Y.
Bingham, Charles C.,
37 Main st., St. Johnsbury, Vt.
BIROTH, HENRY,
481 25th st., Chicago, Ill.
Blackmore, Henry S.,
206 S. 9th ave., Mt. Vernon, N. Y.
Blaikie, William,
202 Genesee st., Utica, N. Y.
BLAKE, JAMES E.,
96 N. 2d st., New Bedford, Mass.
Blakeley, George C.,
175 2d st., The Dalles, Ore.
Blakely, Collins,
5 State st., Montpelier, Vt.
Blakeslee, Louis G.,
Care Mallinckrodt Chem. W'ks, St. Louis, Mo.
Blanding, Wm. O.,
54 Weybosset st., Providence, R. I.
Blank, Alois,
1353 S. 5th st., St. Louis, Mo.
Blome, Walter H.,
523 W. Liberty st., Ann Arbor, Mich.
Blumauer, Louis,
4th & Morrison sts., Portland, Ore.
Boberg, Otto J. S.,
206 S. Barstow st., Eau Claire, Wis.
Boeddiker, Otto,
954 6th ave., New York, N. Y.
Boehm, Solomon,
800 Morgan st., St. Louis, Mo.
Boerner, Emil L.,
113 Washington st., Iowa City, Ia.
Boesewetter, Richard,
1109 Madison st., St. Louis, Mo.
Bohmansson, Robert H.,
Arcata, Humboldt Co., Cal.
Bolink, Elebertus,
118 2d ave. S., Seattle, Wash.
Bond, Jackson N.,
408 Broadway, Mt. Vernon, Ill.
Bond, John B.,
Main & 5th sts., Little Rock, Ark.
Bond, John B., Jr,
323 E. Markham st, Little Rock, Ark.
Bonnette, J. Valarus,
Front & Main sts., Pollock, La.
Borell, Henry A.,
2043 Chestnut st., Philadelphia, Pa.
Bories, Emil,
Room 27 Haller Bldg, Seattle, Wash.
BORING, EDWIN M.,
N. E. cor. 16th & Fairmount ave., Phila., Pa.
Boulton, Emison A.
8 Market st., San Francisco, Cal.
Bowen, Cyrus W.,
Plattsburg, Mo.
Bowen, William A.,
Mombasa, British East Africa.
Boyd, Charles N.,
Main st., Butler, Pa.
Boyd, George W.,
121 Second st., N. E., Washington, D. C.
Boyd, Guy S.,
405 S. George st., York, Pa.
Boyden, Edward C.,
Joy & Myrtle sts., Boston, Mass.
Boyken, John W.,
250 Sutter st., San Francisco, Cal.
Boynton, Herschell,
74 Main st., Biddeford, Me.
Brack, Charles E.,
Ensor & Forrest sts., Baltimore, Md.
Bradbury, Wymond H.,
808 I st., N. W., Washington, D. C.
Bradham, Caleb D.,
Pollock & Middle sts., New Bern, N. C.
Bradley, Theodore J.,
Albany Coll. Pharm., Albany, N. Y.
Bradt, Warren L.,
55–57 Washington ave., Albany, N. Y.
Brandel, Irvin W.,
University of Wisconsin, Madison, Wis.
Brandenberger, Adolph,
130 E. High st., Jefferson City, Mo.
Brecht, Frederick A.,
209 3d st. W., Yankton, S. Dak.
Breunert, August,
1335 Grand ave., Kansas City, Mo.
Brewer, Howard D.,
19 Oxford st., Worcester, Mass.
Brewer, Justin S.,
518 Hudson st., Hoboken, N. J.
Brickman, Arthur O.,
500 E. Baltimore st., Baltimore, Md.
Briggs, Andrew G.,
204 Howitzer Place, Richmond, Va.

Brisley, Harry,
Prescott, Ariz.
Brooks, Virginia C. (Miss),
Waelder, Gonzales Co., Tex.
Brooks, George W.,
1161 Myrtle ave , Brooklyn, N. Y.
Brown, Adin N.,
318 Erie st., Missouri Valley, Ia.
Brown, Chas. M.,
Cleveland State Hospital, Cleveland, O.
Brown, George S.,
2801 St. Charles ave., New Orleans, La.
Brown, James L.,
Marshfield, Ore.
Brown, William A.,
Residence Unknown.
Brown, William T.,
Box 19, Madison, N. J.
Bruck, Philip H.,
961 S. High st., Columbus, O.
Brucker, Carl,
37 Barclay st., New York, N. Y.
Brundage, Albert H.,
1073 Bushwick ave., Brooklyn, N. Y.
Brunner, Norman I.,
4th & Arch sts., Macon, Ga.
Buchanan, Clark G.,
cor. 7th & St. Charles sts., Wellsburg, W. Va.
Burg, John D.,
4th & Brown sts., Philadelphia, Pa.
Burgheim, Jacob,
1019 Congress ave., Houston, Tex.
Burke, William H.,
153 Grand River ave., Detroit, Mich.
Burkhardt, Mark A.,
Third & St. Clair sts., Dayton, O.
Burnham, Alfred A., Jr.,
459 Dudley st., Boston, Mass.
Burns, Edwin M.,
328 S. Superior st., Mason City, Ia.
Burrough, Horace,
509 W. Lombard st, Baltimore, Md.
Burrough, Horace, Jr.,
509 W. Lombard st., Baltimore, Md.
Burton, John C.,
3d st.. Stroud, Okla. Terr.
Busch, Miers,
511–515 Arch st., Philadelphia, Pa.
Butler, Charles H.,
182 W. 1st st., Oswego, N. Y.
Butler, Freeman H.,
391 Middlesex st., Lowell, Mass.

Byers, Huizinga C.,
28 King st , Pottstown, Pa.
Byrne, John,
200 N. High st., Columbus, O.
Caldwell, Joseph F.,
17 Garrison ave., Allegheny City, Pa.
Calkins, Eleazer E.,
324 S. State st., Ann Arbor, Mich.
*Calvert, John*,
Kearney & Clay sts., San Francisco, Cal.
Campbell, Albert A.,
235 Rondo st., St. Paul, Minn.
Campbell, Chas. B.,
200 E st. N. E., Washington, D. C.
Campbell, George D.,
Main st., Lonaconing, Md.
Campbell, Milton,
426 S. 13th st., Philadelphia, Pa.
Campbell, Theodore,
2101 N. 63d st., Overbrook, Philad'a., Pa.
CANDIDUS, PHILIP C.,
Mobile, Ala.
CANNING, HENRY,
109 Green st., Boston, Mass.
Capbern, Andrew E.,
White Castle, La.
Capdau, Pierre A.,
940 Elysian Fields ave., New Orleans, La.
Capper, Wm. E.,
31 School st., Boston, Mass.
Carl-Lee, Reuben B.,
Cor. Front & Fordyce sts., England, Ark.
Carmack, George W.,
Plattsburg, Mo.
Carpenter, Alfred B.,
Main st., Greensville, S. C.
CARRELL, EUGENE A.,
South st., Morristown, N. J.
Carslake, George M.,
Farnsworth ave., Bordentown, N. J.
Carter, Frank H.,
772 Massachusetts ave., Indianapolis, Ind.
Cary, Silas B.,
1201 Grand ave., Kansas City, Mo.
Casalius, Tsidro,
1915 14th st., Tampa, Fla.
Case, Edmund W.,
Main st., Pictou, Ontario, Can.
Caspari, Charles, Jr.,
Maryland Coll. Pharm., Baltimore, Md.
Caspari, Chas. E.,
712 N. Whittier st., St. Louis, Mo.

Caspari, William, Jr.,
1600 Druid Hill ave., Baltimore, Md.
CASPER, THOMAS J.,
41 E. Main st., Springfield, O.
Cassaday, O. U.,
14 W. Federal st., Youngstown, O.
Castlehun, Karl,
2 State st., Newburyport, Mass.
CHANDLER, CHARLES F.,
cor. 116 st. & Amsterdam ave., New York, N. Y.
Cheatham, Thomas A.,
Mulberry & 3d sts., Macon, Ga.
Chesnutt, James H.,
12 Hickory st., Hot Springs, Ark.
Chipman, Gilbert S.,
269 Pearl st., Cambridge, Mass.
Chittick, Justus R.,
Highland Park, Des Moines, Ia.
Civins, Albert I.,
5th & Lombard sts., Philadelphia, Pa.
Claflin, Walter A.,
Harvard Square, Cambridge, Mass.
Clark, John A.,
East King st., Hamilton, Ontario, Can.
Claus, Otto F.,
1116 Montgomery st., St. Louis, Mo.
Cleveland, Jule M.,
Elberton, Ga.
Cliffe, Wm. L.,
2778 Kensington ave., Philadelphia, Pa.
Cline, Raoul R. D.,
1301 Post Office st., Galveston, Tex.
Cobb, Ralph L.,
112 Superior st., Cleveland, O.
Coblentz, Virgil,
115 W. 68th st., New York, N. Y.
Cole, Victor L.,
22 East Market st., Corning, N. Y.
Coleman, John H.,
380 Broad st., Newark, N. J.
Colen, James A.,
383 Court st., Brooklyn, N. Y.
Collier, William K.,
199 E. 7th st., St. Paul, Minn.
Collins, Albert B.,
48 Main st., Westerly, R. I.
Collins, Mary E. (Miss),
9 Pleasant st., Westerly, R. I.
*Colton, James B.*,
766 Tremont st., Boston, Mass.
Cone, Earl H.,
231 Lake st., Chicago, Ill.
Cone, John W.,
48 N. Main st, Providence, R. I.
Congdon, George G.,
Washington av. & 28th st., Newport News, Va.
Conger, Frederic A.,
499 Selby ave., St. Paul, Minn.
Conover, James A.,
241 W. Bay st., Jacksonville, Fla.
Conrad, John,
25 E. 47th st., Chicago, Ill.
Cooban, Benj. S,
559 W. 63d st., Chicago, Ill.
Cook, Alfred P.,
342 Spring st., Portland, Me.
Cook, E. Fullerton,
145 N. 10th st. Philadelphia, Pa.
Cook, Thomas P.,
114 William st., New York, N. Y.
Cookson, Joseph W.,
20 Main st., Kingman, Kan.
Coonley, Charles,
Washington & Michig'n sts., South Bend, Ind.
Cornell, Edward A.,
Pine & Fourth sts., Williamsport, Pa.
Co nell, Edward C.,
Brookings, S. Dak.
Corning, Albion J.,
1501, Bolton st., Baltimore, Md.
Cowan, John,
Navy Yard, Charlestown, Mass.
Cox, Daniel R.,
96 S. Monroe st., Tallahassee, Fla.
Craig, William P.,
Residence Unknown.
Cramer, Max,
1350 Tremont st., Boston, Mass.
Crampton, Ferd L.,
2301 Lexington ave., Kansas City, Mo.
Crane, Frank T.,
Main st., Machias, Me.
Crawford, Frank E.,
354 Friendship st., Providence, R. I.
Crawford, Joseph,
2824 Frankford ave., Philadelphia, Pa.
Crecelius, Chas. E.,
133 Main st., New Albany, Ind.
Creighton, Mary L. (Miss),
Scio, O.
Criswell, Francis M.,
7th & Florida ave. N. W., Washington, D. C.
*Crossman, George A.*,
Raynham, Mass.

Crowdle, John E.,
81 Gardiner st., Newton, Mass
Crum, John D.,
851 Pippin st., Oakland, Jacksonville Fla
Culbreth, David M. R.,
1307 N. Calvert st., Baltimore, Md.
Culpepper, Thomas J.,
Greenville, Ga.
Cureton, George D.,
Limestone st., Gaffney, S. C.
Curry, David W.,
200 Broad st., Rome, Ga.
Curry, Gordon L.,
104 Chestnut st., Louisville, Ky.
Daboll, Horace H.,
119 State st., New London, Conn.
Dadd, Robert M.,
22 Grand ave., Milwaukee, Wis.
Daggett, Chas. H.,
104 Daboll st., Providence, R. I.
Daggett, V. Chapin,
17 W. 34th st., New York, N. Y.
Daly, James E.,
Residence Unknown.
Danek, John F.,
1228 Washington ave. N., Minneapolis, Minn.
Darby, Edmund F.,
King st., Harrow, Ont., Can.
Dare, Charles F.,
84 E. Commerce st., Bridgeton, N. J.
Davidson, Edgar C.,
Main st., Dawson, Ga.
Davies, John J.,
106 S. Main ave., Scranton, Pa.
Davies, Llewellyn P.,
Central City, Colo.
D'Avignon, J. Eugene,
5 Sandwich st., Windsor, Ont., Can.
Davis, Charles H.,
30 State st., Bangor, Me.
Davis, Charles L.,
63 State st., Newburyport, Mass.
Davis, Eugene M.,
309 Lion st., Dunkirk, N. Y.
Davis, John A.,
700 N. Cary st., Baltimore, Md.
Davison, Charles C., Jr.,
1002 Broad st., Columbus, Ga.
Dawson, Edward S., Jr.,
125 S. Salina st., Syracuse, N. Y.
Dawson, John H.
23d & Valencia sts., San Francisco, Cal.
Day, Edward J.,
554 Columbia Road, Dorchester, Mass.
Day, William B.,
465 State st., Chicago, Ill.
*De Forest, William P.*,
1477 Bedford ave., Brooklyn, N. Y.
De Jonge, Cornelius,
36 Doughty st., Brooklyn, N. Y.
De Lang, Alfred,
5 E. 5th st., Cincinnati, O.
De Lorenzi, Albert,
Main & Ervay sts., Dallas, Tex.
*Dearborn, George L.*,
156 Main st., New Market, N. H.
Deck, Lewis C.,
Girard, Macoupin Co., Ill.
Deemer, Geo. M. H.,
opp. Steel Pier, Atlantic City, N. J.
Dennin, Charles,
383 Court st., Brooklyn, N. Y.
Dennin, Edwin C.,
383 Court st., Brooklyn, N. Y.
Depeyre, Louis N.,
2401 W. 32nd ave., Denver, Colo.
Devine, John,
Santa Monica, Cal.
Dewender, Wm. H.,
167 Atlantic ave., Brooklyn, N. Y.
Dewoody, William L.,
120 W. Barraque st., Pine Bluff, Ark.
Dickinson, Arthur L.,
297 Main st., Danbury, Conn.
Dickman, Gustave A.,
499 Selby ave., St. Paul, Minn.
Diebert, Thomas I.,
103 North Centre st., Pottsville, Pa.
Diehl, C. Lewis,
1346 E. Broadway, Louisville, Ky.
Diekman, George C.,
115 W. 68th st., New York, N. Y.
Dietz, Emil,
702 Germania st., Milwaukee, Wis.
Dillenback, Garett V. d. V.,
144 State st., Albany, N. Y.
Dillon, William E.,
1526 Woodward ave., Detroit, Mich.
Dilly, Oscar C.,
2101 W. Walnut st., Louisville, Ky.
Dimmitt, Addison,
5th ave. & Walnut st., Louisville, Ky.
Dimock, Robert H.,
303 Congress st., New Haven, Conn.

Dinkler, Frank A.,
Hennessey, Okla. Ter
Dixon, J. Marion,
Julia st. & Washington ave., Titusville, Fla.
DOBBINS, EDWARD T.,
1511 Samson st., Philadelphia, Pa.
Dodds, Richard N.,
5th & Monroe sts., Springfield, Ill.
Dodson, James G.,
423 Jackson st., Americus, Ga.
Doersam, Philip, Jr.,
Washington ave. & Marion st., Scranton, Pa.
Dohme, Alfred R. L.,
Pratt & Howard sts., Baltimore, Md.
DOHME, CHARLES E.,
Pratt & Howard sts., Baltimore, Md.
Dohme, C. Louis,
Pratt & Howard sts., Baltimore, Md.
DOHME, LOUIS,
Pratt & Howard sts., Baltimore, Md.
*Doliber, Thomas,*
Atlantic ave. & India st., Boston, Mass.
Donaghue, James,
Second st., Girardville, Pa.
Donaghue, Theresa V.,
Second st., Girardville, Pa.
Donnel, Cornelius P.,
431 Arch st., Philadelphia, Pa.
Donohue, Henry,
702 Washington st., San Francisco, Cal.
Dorr, George W.,
118 Main st., Waterville, Me.
Dorsheimer, George V.
600–602 E. Walnut st., Des Moines, Ia.
Dort, Edward H.,
Auburn, Neb.
Doty, Wirt P.,
789 Woodward ave., Detroit, Mich.
Dougherty, Samuel E.,
Chatham, N. J.
Douglas, John N.
Olyphant, Pa.
Douglass, Henry,
614 Wythe ave., Brooklyn, N. Y.
Dowdy, Joseph F.,
204 Main st., Little Rock, Ark.
Downing, Benjamin F., Jr.,
42 Broadway, Newport, R. I.
Downing, Ernest A.,
600 E. Grand ave., Des Moines, Ia.
Drach, George L.,
1839 Broadway, Cleveland, O.
Drake, Frederick T.,
7 Myrtle st., Stoneham, Mass.
DRAKE, JOHN R.,
365 E. Water st., Milwaukee, Wis.
Drake, Wallace C.,
1238 Euclid ave., Cleveland, O.
Drechsler, Frank X.,
168 Western ave. N., St. Paul, Minn.
Dresser, George E.,
Main st., Putnam, Conn.
Drew, Walter I.,
202 Brackett st., Portland, Me.
Drossel, August A.,
1203 Powell st., San Francisco, Cal.
DRURY, LINUS D.,
Warren & Dudley sts., Boston, Mass.
DuBois, William L.,
281 Main st., Catskill, N. Y.
Duckett, Walter G.,
22 st. & Penna. ave., Washington, D. C.
Duering, Henry C.,
3942 Olive st., St. Louis, Mo.
Duggan, James,
254 Asylum st., Hartford, Conn.
Dulaney, Joseph F.,
McKinney, Callin Co., Tex.
Dunham, Andrew A.,
Northfield, Vt.
DUNN, JOHN A.,
36 Doughty st., Brooklyn, N. Y.
Dunn, Joseph H.,
1234 Hillary st., New Orleans, La.
Dunning, H. A. Brown,
411 E. North ave., Baltimore, Md.
Dunwody, Richard G.,
493 Peachtree st., Atlanta, Ga.
Durban, Sebastian C.,
708 Broad st., Augusta, Ga.
Durkee, Wm. C.,
392 Boylston st., Boston, Mass.
Dutcher, Alfred L.,
109 Main st., St. Albans, Vt.
Dye, Clair A.,
Ohio State University, Columbus, O.
Eads, Robert L.,
100 E. New York st., Indianapolis, Ind.
Easterday, Herbert C.,
700 New Jersey ave. N.W., Washington, D.C.
Eaton, Harry E.,
Essex, Page Co., Ia.
Eaton, Harvey K.,
700 Columbus ave., New York, N. Y

Eberbach, Ottmar,
25 South Main st., Ann Arbor, Mich.
Eberle, Eugene G.,
Care Texas Drug Co., Dallas, Tex.
Eberle, Herman T.,
204 Main st., Watertown, Wis.
EBERT, ALBERT E,
426 State st., Chicago, Ill.
Eccles, Robert G.,
191 Dean st., Brooklyn, N. Y.
Eckert, John,
167 Ferry st., Newark, N. J.
*Eckford, Joseph Wm.*,
Commerce st., Aberdeen, Miss.
Eckler, Charles R.,
701 E. ave., Elyria, O.
Eckstein, Andrew J.,
125 N. Minnesota st., New Ulm, Minn.
Edelen, Charles A.,
176 Bank st., Louisville, Ky.
Edwards, Frederick B.,
55 Farmington ave., Hartford, Conn.
Ehrlicher, Henry M.,
324 Court st., Pekin, Ill.
Eichrodt, Charles W.,
227 S. Illinois st., Indianapolis, Ind.
Eigelberner, Harry B.,
185 W. Randolph st., Chicago, Ill.
Eilbracht, William E.,
Waterloo, Monroe Co., Ill.
Einstein, Morris,
1424 East st., Allegheny City, Pa.
Elbrecht, Oscar H.,
Care Female Hospital, St. Louis, Mo.
Elder, Herbert P.,
Cor. Main & First sts., Woodland, Cal.
Elderdice, William J.,
111 Baltimore st., Cumberland, Md.
Eliel, Leo,
230 W. Washington st., South Bend, Ind.
Elliott, Chas. H.,
14th & Binney sts., N. W., Washington, D. C.
ELLIOTT, HENRY A.,
673 W. Lexington st., Baltimore, Md.
*Ellis, Evan T.*,
4409 Chestnut st., Philadelphia, Pa.
Emanuel, Louis,
2d ave. & Grant st., Pittsburg, Pa.
EMICH, COLUMBUS V.,
407 N. Greene st., Baltimore, Md.
Engelhard, George P.,
358 Dearborn st., Chicago, Ill.
England, Joseph W.,
415 N. 33d st., Philadelphia, Pa.
Englander, Samuel,
Navy Yard, Brooklyn, N. Y.
English, George E.,
704 Franklin ave., Cleveland, O.
Eppstein, Jacob,
287 S. 5th st., Philadelphia, Pa.
Ernst, Frank F.,
186 Lamartine st., Jamaica Plain, Mass.
Estabrook, Henry A.,
Fitchburg, Mass.
Esters von Krakau, W.,
25th & Folsom sts., San Francisco, Cal.
Etzel, John L.,
Clear Lake, Cerro Gordo, Ia.
Euler, Frederick C.,
1301 N. Broadway, St. Louis, Mo.
Evans, George B.,
1106 Chestnut st., Philadelphia, Pa.
Evans, Joseph S.,
P. O. Box 567, West Chester, Pa.
Eyssell, George,
1036 Union ave., Kansas City, Mo.
Faber, Walter E.,
313 Bowery, New York, N. Y.
Fairchild, Benjamin T.,
P. O. Box 1120, New York, N. Y.
Fairchild, Samuel W.,
84 Fulton st., New York, N. Y.
Falk, John C.,
2700 Stoddard st., St. Louis, Mo.
Famulener, Lemuel W.,
Care of Nelson, Baker & Co., Detroit, Mich.
Federmann, William M.,
904 Main st., Kansas City, Mo.
Feick, Charles,
301 Hanover st., Baltimore, Md.
Feidt, George D.,
604 Arch st., Philadelphia, Pa.
Feil, Joseph,
513 Giddings ave., Cleveland, O.
Fennel, Charles T. P.,
8th & Vine sts., Cincinnati, O.
Fenner, Harvey A.,
Broad st. & Columbia ave., Philadelphia, Pa.
Fieber, Gustavus A.,
2400 Spring Grove ave., Cincinnati, O.
Field, Claud,
318 E. St. Clair st., Indianapolis, Ind.
Field, Wm. C.,
H and 3d sts. N. E., Washington, D. C.

Finch, Chas. S.,
134 Atlantic st., Stamford, Conn.
Fink, Daniel J.,
Holdrege, Neb.
Finlay, Alexander K.,
124 Baronne st., New Orleans, La.
Firmin, John C.,
319 S. Main st., Findlay, Hancock Co., O.
Firth, Samuel S.,
939 Woodland ave., Cleveland, O.
Fischer, Henry,
1948 Gravois ave., St. Louis, Mo.
Fischer, Henry J.,
439 Pearl st., Cleveland, O.
Fischer, Richard,
University of Wisconsin, Madison, Wis.
FISH, CHAS. F.,
348 Broadway, Saratoga Springs, N. Y.
Fisher, Dora C. (Miss),
1018 S. 3d st., Leavenworth, Kan.
Fisher, George W.,
De Land, Fla.
Fishman, Casriel,
Care Meyer Bros. Drug Co., St. Louis, Mo.
Fisk, Frank E.,
750 W. Harrison st., Chicago, Ill.
Flemer, Lewis,
701 Maryland ave. N. E., Washington, D. C.
Fletcher, John W.,
Main st., Batesville, Ark.
Ford, Charles M.,
700 15th st., Denver, Colo.
Ford, Edgar F.,
335 S. Union ave., Pueblo, Colo.
Forsyth, William K.,
3100 State st., Chicago, Ill.
Foster, J. Webb,
637 Hanover st., Baltimore, Md.
Foster, John B.,
Roseville & 7th aves., Newark, N. J.
Fouch, William M.,
1 North ave. W., Baltimore, Md.
FOUGERA, EDMUND C. H.,
309 8th st., Brooklyn, N. Y.
Foulke, James,
107 Monticello ave., Jersey City Heights, N. J.
Fox, Peter P.,
Woodland ave. & 73d st., Philadelphia, Pa.
Fox, Willard M.,
1492 Cedar ave., Cleveland, O.
Frailey, William O.,
248–250 E. King st., Lancaster, Pa.
Frames, J. Fuller,
601 N. Gay st., Baltimore, Md.
Franzoni, Joseph D.,
627 Penna. ave. N. W., Washington, D. C.
Fraser, Horatio N.,
262 5th ave., New York, N. Y.
Frauer, Herman E.,
246 E. Washington st., Indianapolis, Ind.
French, Harry B.,
429 Arch st., Philadelphia, Pa.
French, Rolland H.,
Care W. S. Merrell Chem. Co., Cincinnati, O.
Frerichs, Frederick W.,
4608 S. Broadway, St. Louis, Mo.
Fricke, Frederick G.,
Union Block, Plattsmouth, Neb.
Fricke, Frederick H.,
1637 N. 9th st., St. Louis, Mo.
Friedewald, Hermann W.,
4100 Finney ave., St. Louis, Mo.
FROHWEIN, RICHARD,
122 1st st., Elizabeth, N. J.
Frost, Wm. A.,
Selby & Western aves., St. Paul, Minn.
Fry, Herman,
266 E. North ave., Chicago, Ill.
Frye, Geo. C.,
320 Congress st., Portland, Me.
FULLER, OLIVER F.,
220 Randolph st., Chicago, Ill.
Fulton, Peter MacM.,
Gayville, S. Dak.
Funsch, Oliver J.,
3134 S. 7th st., St. Louis, Mo.
Gable, Ralph B.,
51 Maiden Lane, New York, N. Y.
Gaesser, Theobald T.,
Troy, Ind.
Gahn, Henry,
378 Washington st., New York, N. Y.
*Gale, Edwin O.*,
85 S. Clark st., Chicago, Ill.
Gale, Walter H.,
34 Washington st., Chicago, Ill.
*Gale, William H.*,
82 S. Clark st., Chicago, Ill.
Gallagher, John C.,
466 Grove st., Jersey City, N. J.
Gallenkamp, Edward W.,
212 Main st., Washington, Mo.
Gamble, Stewart,
301 Hennepin ave., Minneapolis, Minn.

Gamer, Albert C. C.,
P. O. Box 772, Tacoma, Wash.
Gane, Eustace H.,
91 Fulton st., New York, N. Y.
Gann, Henry,
1611 2d ave., Columbus, Ga.
Gano, William H.,
1634 Columbia ave., Philadelphia, Pa.
Garber, Elmer F. W.,
31 E. Main st., Mount Joy, Lanc. Co., Pa.
GARDNER, ROBERT W.,
156 William st,, New York, N. Y.
Garrett, Oscar N.,
110 N. High st., Hillsboro, O.
Gaus, Charles H.,
202 Washington ave., Albany, N. Y.
Gayle, John W.,
cor. Ann st. & Broadway, Frankfort, Ky.
Geisler, Joseph F.,
6 Harrison st., New York, N. Y.
GEORGE, CHARLES T.,
1306 N. 3d st., Harrisburg, Pa.
Gessner, Emil A.,
301 Chapel st., New Haven, Conn.
Gettel, J. Ralph E.,
4701 5th ave., East End. Pittsburg, Pa.
Gibbard, George E.,
287 King st. W., Toronto, Can.
Gilbert, Robert B.,
Greenville, Ga.
Gilchrist, Nellis R.,
Wakonda, S. Dak.
Gilpin, Henry B.,
3cc–302 W. Lombard st., Baltimore, Md.
Gleghorn, James S.,
cor. Brushton ave. & Tioga st., Pittsburg, Pa.
Gleim, John C.,
301 Superior st., Cleveland, O.
Glick, Harry E.,
526 N. 9th st., Lafayette, Ind.
Glover, William H.,
297 Essex st., Lawrence, Mass.
Godbold, Fabius C.,
2728 Prytania st., New Orleans, La.
Godding, John G.,
278 Dartmouth st., Boston, Mass.
Goldmann, Oscar,
2126 3d ave., New York, N. Y.
Goldsborough, Charles H.,
Culpeper, Va.
Good, James M.,
2348 Olive st., St. Louis, Mo.
Goodale, Harvey G.,
P. O. Box 2, Jamaica, Queens Co., N. Y.
*Goodwin, William W.*,
Newburyport, Mass.
Gordin, Harry M.,
380 Chestnut st., Chicago, Ill.
Gordon, Frederick T.,
Bureau Med.&Surg.,Navy Dept.,Wash.,D.C.
Gordon, Jean (Miss),
31 Washington st., Chicago, Ill.
*Gordon, William J. M.*,
710 Plum st., Cincinnati, O.
Gorgas, George A.,
16 N. Third st., Harrisburg, Pa.
Grace, Wm. D.,
14 Market Square, Portsmouth, N. H.
Graf, Carl A.,
120 N. Santa Fe ave., Salina, Kan.
Graham, Willard,
4304 Walnut st., Philadelphia, Pa.
Grambois, Augustin,
1001 Esplanade ave., New Orleans, La.
Grant, Isaac,
38 3d st., San Francisco, Cal.
Grassly, Charles W.,
287 W. 12th st., Chicago, Ill.
Grauel, Otto H.,
Norfolk, Neb.
Gray, Henry R.
122 St. Lawrence Main st., Montreal, Can.
Gray, Margaret McC. (Mrs.),
326 Park ave., Chicago, Ill.
Gray, William,
833 W. Lake st., Chicago, Ill.
Green, Benjamin,
12 Market Square, Portsmouth, N. H.
Green, Samuel L.,
Washington st., Camden, Ark.
Greene, William R.,
1 Westminster st., Providence, R. I.
Greenthal, Julius,
1174 Michigan ave., Detroit, Mich.
Gregorius, George.
369 8th ave., New York, N. Y.
Gregory, Willis G.,
530 Main st., Buffalo, N. Y.
Greule, Albert M.,
cor. 4th & Overton sts., Newport, Ky.
Greve, Charles M.,
6th & Market sts., Chattanooga, Tenn.
Grewe, Louis F.,
1628 S. Grand ave., St. Louis, Mo

Greyer, Julius,
Vine & Findlay sts., Cincinnati, O.
Griffith, Chas.,
501 Main st., Johnstown, Pa.
Griffiths, Joseph,
1120 Main st, Kansas City, Mo.
Gross, Chas. E.,
14th & Park sts. N. W., Washington, D. C.
Gross, Edward Z.,
119 Market st., Harrisburg, Pa.
Gross, William O.,
Washington & Barr sts., Ft. Wayne, Ind.
Grossjohann, Ernst,
Hospital Corps, U. S. A., Manila, P. I.
Grossklaus, John F.,
High st., & Public Square, Navarre, O.
Groves, Henry C.,
68 W. Broadway, Ocala, Fla.
Guerin, James F.,
236 Front st., Worcester, Mass.
Guidry, Ambrose J.,
care of Finlay, Dicks & Co., New Orleans, La.
Gundrum, George,
329 W. Main st., Ionia, Mich.
Haake, William H.,
795 Central ave., Cleveland, O.
Haddad, Saleem F.,
89 Broad st., New York, N. Y.
Haffner, Jean C.,
2846 Market st., St. Louis, Mo.
Hagans, Daniel A.,
2 Front st., Monroe, Mich.
Hagee, William P.,
101 N. Main st., St. Louis, Mo.
Hagenow, Theodore F.,
1500 Chouteau ave., St. Louis, Mo.
Hahn, Charles W. J. H.,
2300 Salisbury st., St. Louis, Mo.
Haines, Walter S.,
Augusta Arsenal, Augusta, Ga.
Haley, John B.,
50 E. Washington st., New Castle, Pa.
Hall, Alden T.,
362 St. Peter st., St. Paul, Minn.
Hall, Edwin B.,
173 Main st., Wellsville, Allegheny Co., N.Y.
Hall, Joseph P.,
17 Washington Sq., Suffolk, Va.
Hall, Lincoln G.,
Coggin, Ia.
Hall, Mary S. (Mrs.),
177 31st st., Chicago, Ill.
Hall, William A.,
177 Griswold st., Detroit, Mich.
Hallberg, Carl S. N.,
358 Dearborn st., Chicago, Ill.
Halstead, Alice L. (Mrs.),
1101 E. Front st., Muscatine, Ia.
Hamilton, Clarence B.,
Longview, Tex.
Hamilton, William C.,
910 Main st., Bridgeport, Conn.
Hammar, Alrick,
Pharmacist, U. S. Navy, Mare Island, Cal.
Hance, Anthony M.,
623 Callowhill st., Philadelphia, Pa.
Hance, Edward H.,
Callowhill & Marshall sts., Phila., Pa.
Hancock, Chas. W.,
P. O. Box 55, Langhorne, Pa.
Hancock, John F.
4 S. Howard st., Baltimore, Md.
Haney, Thomas C.,
102 E. Schiller st., Columbus, O.
Hankey, William T.,
111 Water st., Cleveland, O.
Hannan, Owen B.,
74 Frankfort st., Cleveland, O.
Hansen, Hans,
Residence Unknown.
Harbaugh, Duncan J.,
Haverford, Montgomery Co., Pa.
Harbaugh, Wilson L.,
Haverford, Montgomery Co., Pa.
Hardin, John H.,
226 S. Front st., Wilmington, N. C.
Hardman, Lamartine G.,
Harmony Grove, Ga.
Harlow, Noah S.,
4 Smith's Block, Bangor, Me.
Harper, Harry L.,
520 Court st., Beatrice, Neb.
*Harrington, Frank,*
Main & Market sts., Logan, O.
Harris, Francis M.,
26 Benefit st., Worcester, Mass.
Harrison, Robert L.,
607 Louisiana st., Richmond, Va.
Harrison, William J.,
Main st. & Clifton ave., Lakewood, N. J.
Harter, Isaac F.,
Stronghurst, Ill.
Hartigan, Joseph D.,
1299 Main st., Bridgeport, Conn.

Harting, Rudolph R.,
Short & Mill sts., Lexington, Ky.
Hartwig, Otto J.,
1570 Milwaukee ave., Chicago, Ill.
Hartz, Johann D. A.,
137 13th st., College Point, N. Y.
Harvey, George A.,
cor. 7th & Victory sts., Little Rock, Ark.
Harvey, Wade,
Jefferson & Wash'n sts., Kosciusko, Miss.
Hassinger, Samuel E. R.,
Fairmount ave. & 23d st., Philadelphia, Pa.
Hatton, Edgar M.,
Hotel Vendome, Capitol Sq., Columbus, O.
Hatton, Ellmore W.,
90 N. High st., Columbus, O.
Hauenstein, William,
375 Amsterdam ave., New York, N. Y.
Haussmann, Frederick W.,
1627 N. 8th st., Philadelphia, Pa.
Havenhill, L. D.,
1133 Kentucky st., Lawrence, Kan.
Hay, Chas. L.,
209 E. Du Bois ave., Du Bois, Pa.
Hay, Edward A.,
Middle & Free sts., Portland, Me.
Haydock, Mabelle (Miss),
2516 N. 32d st., Philadelphia, Pa.
Hayes, Horace P.,
312 Elk st., Buffalo, N. Y.
Hayes, James H.,
305 Sumner st. E, Boston, Mass.
Haynes, David O.,
8 Spruce st., New York, N. Y.
Hays, Francis B.,
100 Williams st., New York, N. Y.
Hazard, Elmer C.,
Shrewsbury, N. J.
Hazlett, James L.,
Hearne, Robertson Co. Tex.
Heath, George M.,
Big Rapids, Mich.
Hechler, George L.,
1099 Broadway, Cleveland, O.
Heebner, Charles F.,
Ontario Coll. Pharm., Toronto, Can.
Heim, Henry,
James & 3d sts., Saginaw, E. S., Mich.
Heim, William J.,
1454 N. 10th st., Philadelphia, Pa.
Heinitsh, Sigmund W.,
16 E. King st., Lancaster, Pa.
Heinrich, Max P.,
300 S. 14th st., St. Louis, Mo.
Heinritz, Lebrecht G.,
128 South st., Holyoke, Mass.
*Heintzelman, Joseph A.*,
Ridge & College aves., Philadelphia, Pa.
Helfman, Joseph,
322 Field ave., Detroit, Mich.
Heller, Chas. T.,
529 Wabasha st., St. Paul, Minn.
Hemm, Francis,
Grand ave. & Arsenal st., St. Louis, Mo.
Hemm, Louis P.,
Webster & Jefferson aves., Kirkwood, Mo.
Hengst, J. Edwin,
Gay st. & Central ave., Baltimore, Md.
Henkel, Alice (Miss),
1737 U st. N. W., Washington, D. C.
Henkel, Charles B.,
Md. ave. & Prince George st., Annapolis, Md.
Henry, Charles (Dworniczak),
Croton-on-Hudson, N. Y.
Henry, Frank C.,
703 15th st. N. W., Washington, D. C.
Henry, W. P.,
819 Wal st., Des Moines, Ia.
Hepburn, John,
103 Main st., Flushing, N. Y.
Herb, Joseph,
528 Tower ave., Superior, Wis.
Herbst, William P.,
2500 Penna. ave. N. W., Washington, D. C.
Hereth, Frank S.,
314 Belden ave., Chicago, Ill.
Herold, Lodimir,
1663 Broadway, Cleveland, O.
Hess, Paul L.,
Independence & Forest avs., KansasCity, Mo.
Heuisler, Philip I.,
308–310 W. Lombard st., Baltimore, Md.
HEYDENREICH, EMILE,
30 N. William st., New York, N. Y.
*Heyl, James B.*
Vice-Consul, Hamilton, Bermuda.
Hickerson, William H.,
Warren, Huntingdon Co., Ind.
Higgins, Edward A.,
6th st. & Grand av., Des Moines, Ia.
High, Raymond L.,
Box 234, Worcester, Mass.
Hilton, Samuel L.,
1033 22d st. N. W., Washington, D. C.

Hinrichs, Carl G.,
4106 Shenandoah ave., St. Louis, Mo.
Hinrichs, Gustavus D.,
4106 Shenandoah ave., St. Louis, Mo.
Hinton, Rufus G.,
Residence Unknown.
Hiriart, Sebastian,
Bank & Plaquemine sts., Plaquemine, La.
Hirseman, Felix,
1168 Ogden ave., New York, N. Y.
Hitchcock, George H.,
1031 6th ave., New York, N. Y.
Hitchcock, John E.,
Custom House Sq., Plattsburg, N. Y.
Hoch, Aquila,
543 E. Thompson st., Philadelphia, Pa.
Hodgkinson, Albert E.,
319-321 Kelly ave., Devil's Lake, N. Dak.
Hodgson, Joseph A.,
196 Whalley ave., New Haven, Conn.
Hoffmann, George F.,
Pesotum, Ill.
Hoffmann, Herman,
1019 Congress ave., Houston, Tex.
Hogan, John J.,
90 Meadow st., New Haven, Conn.
Hoge, John S.,
562 Cherry st, Macon, Ga.
Hollander, Joseph M.,
915 Braddock ave., Braddock, Pa.
Holliday, Francis F.,
523 Kansas ave., Topeka, Kan.
Holmes, Clay W.,
410 W. Gray st., Elmira, N. Y.
Holmes, Henry E.,
Seattle, Wash.
Holsendorf, Benjamin F.,
P. H. & M. H. Service, Havana, Cuba.
Holt, Edwin M.,
U. S. Marine Hospital, Louisville, Ky.
Holzhauer, Charles,
787 Broad st., Newark, N. J.
Hood, Charles I.,
Merrimac & Central sts., Lowell, Mass.
Hood, Reuben C.,
431 Marietta st., Atlanta, Ga.
Hope, Robert L.,
Centralia, Mo.
Hopkins, Jesse L.,
Woodbridge Bldg., New York, N. Y.
Hopkins, Zerah B.,
Brandon, Vt.
Hopp, Lewis C.,
256 Euclid ave., Cleveland, O.
Hopping, Charles E.,
Beaver City, Neb.
Horn, Wilbur F.,
32 West Main st., Carlisle, Pa.
Horne, Warren W.,
23 Hay st., Fayetteville, N. C.
Houghton, E. Mark,
305 Pennsylvania ave., Detroit, Mich.
Hover, William A.,
1437 Lawrence st., Denver, Colo.
Howard, Fletcher,
Des Moines, Ia.
Howell, Edward V.,
Chapel Hill, N. C.
Howson, Arthur B.,
Paint & Main sts., Chillicothe, O.
Huder, Henry J.,
52 E. Washington st., Indianapolis, Ind.
Hudnut, Richard A.,
44 E. 19th st., New York, N. Y.
Hudson, Arthur,
Centre st., Newton, Mass.
Huested, Alfred B.,
77 Eagle st., Albany, N. Y.
Hughes, Francis S.,
15th & Oxford sts., Philadelphia, Pa.
Huhn, George,
Care Ger. Amer. Bank, Minneapolis, Minn.
Hummel, John A.,
New Madrid, New Madrid Co., Mo.
Hurd, John C.,
26 Market st., Somersworth, N. H.
Hurlebaus, George W.,
2030 14th st. N. W., Washington, D. C.
Hurty, John N.,
104 N. Penn st., Indianapolis, Ind.
Huston, Charles,
47 S. High st,, Columbus, O.
Hynson, Henry P.,
423 N. Charles st., Baltimore, Md.
Ilhardt, William K.,
4836 Delmar Boulevard, St. Louis, Mo.
Ink, Charles E.,
Columbiana, O.
Irvine, Darwin W.,
care Smith Drug Co., Salt Lake City, Utah.
Itizarri Pino, Miguel,
Cosmopolit'nDrugCo.,YborCity,Tampa,Fla.
Ittner, William F.,
2301 S. Grand ave., St. Louis, Mo.

Jackman, Wilbur F.,
Orono, Me.
Jackson, Frank A.,
90 Main st., Woonsocket, R. I.
Jackson, William J.,
44 Third st., San Francisco, Cal.
Jacobs, Charles C.,
Constancia, Cienfuegos, Cuba.
JACQUES, GEORGE W.,
Broadway & Augusta sts., S. Amboy, N.J.
*James, Frank L.*,
St. Louis, Mo.
Jamieson, George A ,
816 North ave., Bridgeport, Conn.
JAMIESON, THOMAS N.,
4508 Woodlawn ave., Chicago, Ill.
Janssen, Jacob S.,
Milwaukee & Wisconsin sts., Milwaukee, Wis.
Jeffers, Clyde N.,
Yukon, Okla. Terr.
Jelliffe, Smith E ,
231 W. 71st st., New York, N. Y.
*Jenks, William J.*,
4043 Market st., Philadelphia, Pa.
*Jesson, Jacob.*
Euclid ave., Ontario, Cal.
Joergensen, Sophus,
Commercial st., LaConner, Skagit Co., Wash.
Johns, William G.,
103 Worley st., Cleveland, O.
Johnson, Ambrose,
Jacksonville, Tex.
Johnson, Charles W.,
Lock Box 114, University Sta., Seattle, Wash.
Johnson, Fletcher V.,
3647 Russell ave., St. Louis, Mo.
Johnson, Ralph H.,
Monongahela & Duquesne aves, Swissvale, Pa.
Jones, Alexander H.,
9th & Parrish sts , Philadelphia, Pa.
Jones, David F.,
106 Granite Block, Watertown, S. Dak.
Jones, James T.,
855 E. 4th st., South Boston, Mass.
Jones, Oscar W.,
27 Court st., Auburn, Me.
Jones, Philip M.,
31 Post st., San Francisco, Cal.
Jones, Simon N.,
1st & Jefferson sts., Louisville, Ky.
Jones, William D.,
107 E. Bay st., Jacksonville, Fla.
Jorden, Henry A.,
56 E. Commerce st., Bridgeton, N. J.
Jorgenson, Edward B.,
702 Washington st., San Francisco, Cal.
Jorgenson, Hans C.,
Navy Yard, Washington, D. C.
Judd, Albert F.,
Pittsburg Coll. Pharm., Pittsburg, Pa.
Judge, Charles R.,
515 Olive st., St. Louis, Mo.
Junger, William F. F.,
123 Broad st., Reinbeck, Ia.
Jungmann, Julius,
1020 3d ave., New York, N. Y.
Kaemmerer, Wm. F.,
410 S. 6th st., Columbus, O.
Kahn, Harry,
4705 Indiana ave., Chicago, Ill.
Kalish, Julius,
383 Grand st., New York, N. Y.
Kalish, Oscar G.,
23d st. & 4th ave., New York, N. Y.
Katz, Gustave,
2139 St. Charles ave., New Orleans, La.
Kauffman, George B.,
235 N. High st., Columbus, O.
Keaney, James J.,
Charles & West sts., Malden, Mass.
Kebler, Lyman F.,
Bureau of Chemistry, Washington, D. C.
Keenan, Thomas J.,
66 W. Broadway, New York, N. Y.
Keeney, Caleb R.,
16th & Arch sts., Philadelphia, Pa.
Kemp, Edward,
135 Water st., New York, N. Y.
Kendall, John L.,
Omaha Coll. Pharm., Omaha, Neb.
Kendall, Wallace W.,
Superior, Neb.
Kennedy, Ezra J.,
8 Spruce st , New York, N. Y.
Kent, Henry A., Jr.,
E. Broad st. & Jefferson ave., Elizabeth, N.J.
*Kent, Robert R.*,
220 W. 70th st., New York, N. Y.
Kephart, Philip,
Berrien Springs, Mich.
Keppler, Christian L.,
461 Dryades st., New Orleans, La.
Kerns, William B.,
Bunceton, Cooper Co., Mo.

Kerr, William W.,
Fullerton, Orange Co., Cal.
Kettler, Edward, Jr.,
Farwell ave. & Brady st., Milwaukee, Wis.
Kienth, Hans,
608 Mitchell st., Milwaukee, Wis.
Kilmer, Frederick B.,
147 College ave., New Brunswick, N. J.
King, Campbell T.,
Cotton ave. & Mulberry st., Macon, Ga.
King, Ferdinand H.,
205 Main st., Delphos, O.
King, George A. N.,
First ave. N. & 3d st., Minneapolis, Minn.
KING, JAMES T.,
Main & South sts., Middletown, N. Y.
King, Robert P.,
Helena, Ark.
Kinney, Charles N.,
3002 University ave., Des Moines, Ia.
Kirchgasser, William C.,
74 Laight st., New York, N. Y.
Kirchgessner, William C.,
129 Monroe st., Grand Rapids, Mich.
Kirk, James E.,
1245 Main st., Jacksonville, Fla.
Kirkland, Derwentwater,
320 S. Spring st, Los Angeles, Cal.
Klein, Ernest F.,
218 Central ave., Hot Springs, Ark.
Kleine, Oscar C., Jr.,
110 Hamburgh ave., Brooklyn, N. Y.
Kleinschmidt, Augustus A.,
101 S. 4th st., St. Louis, Mo.
Klie, Carl G. E.,
5100 N. Broadway, St. Louis, Mo.
Klie, G. H. Charles,
5100 N. Broadway, St. Louis, Mo.
Kline, Clarence M.,
266W.Tulpehocken st.,Germant'n,Phila.,Pa.
Kline, Mahlon N.,
427 Arch st., Phila., Pa.
Klor, Alex. E. G.,
2601 Washington ave., Newport News, Va.
Kloster, Benjamin J.,
329 4th st., Sioux City, Ia.
KLUSSMANN, HERMANN,
110 First st., Hoboken, N. J.
Knabe, Gustavus A.,
Court Sq. & Dexter ave., Montgomery, Ala.
Knight, William C.,
P. O. Box 819, Carrollton, Mo.
Knoebel, Thomas,
209 Collinsville ave., East St. Louis, Ill.
Knoefel, Bruno,
1419 E. Spring st., New Albany, Ind.
Knoefel, Charles D.,
110 E. Market st., New Albany, Ind.
Knox, James W. T.,
242 Bellevue ave., Detroit, Mich.
Koch, August F.,
Amana, Ia.
Koch, Julius A.,
Bluff & Pride sts., Pittsburg, Pa.
Koch, Louis,
329 N. 4th st., Philadelphia, Pa.
Koelle, Otto C.,
518 Wall st., Sioux City, Ia.
Koeneke, Charles H.,
6821 Manchester ave., St. Louis, Mo.
Kolb, William W.,
M. H. S., Savannah Quarantine Station, Ga.
Kolsch, Julius,
202 Harrison ave., Leadville, Colo.
Kornmann, Henry,
831 Harlem ave., Baltimore, Md.
Kosminsky, Leonce J.,
Residence Unknown.
KRAEMER, HENRY,
424 S. 44th st., Philadelphia, Pa.
Krause, John,
789 Woodland ave., Cleveland, O.
Krembs, Ernest M.,
420 11th ave., Milwaukee, Wis.
Kremers, Edward,
Univ. of Wisconsin, Madison, Wis.
Krewson, William E.,
1822 N. Franklin st., Philadelphia, Pa.
Krueger, Owen W.,
5th & Broadway, Kansas City, Mo.
Kuder, William F.,
342 Jennings ave., Cleveland, O.
Kuehne, Charles,
571 Central ave., Jersey City Heights, N. J.
La Pierre, Elie H.,
96 River st., Cambridgeport, Mass.
La Wall, Charles H.,
115 N. 50th st., Philadelphia, Pa.
Lachance, Seraphin,
1538 St. Catharine st., Montreal, Can.
Laird, John,
Springdale, Washington Co., Ark.
Lamar, Henry J.,
519 Forsyth st., Vineville, Macon, Ga.

Lamar, William R.,
Mallinckrodt Chem. Works, St. Louis, Mo.
Lamont, William H.,
11 S. 4th st., St. Louis, Mo.
Lampa, Robert R.,
120 William st., New York, N. Y.
LAND, ROBERT H.,
812 Broad st., Augusta, Ga.
Land, Robert H., Jr.,
1134 Broad st., Augusta, Ga.
Lascoff, Jacob L.,
Lexington ave. & 83d st., New York, N. Y.
Lauricella, Felice,
275 Hanover st., Boston, Mass.
Lawson, Charles E.,
1714 Holly St., Kansas City, Mo.
Layton, Thomas,
2743 N. Grand ave., St. Louis, Mo.
Le Richeux, Alfred C.,
405 E. 4th st., Duluth, Minn.
LEE, JAMES A.,
Main st., New Iberia, La.
Leeb, Theodore F.,
501 W. 5th st., Winona, Minn.
Leedom, Charles,
1403 Filbert st., Philadelphia, Pa.
Legel, John G.,
Charles City, Ia.
Legendre, Joseph A.,
201 Dauphine st., New Orleans, La.
Lehr, Philip,
1145 Lorain st., Cleveland, O.
Lehritter, George P.,
Freehold, N. J.
LEIS, GEORGE,
747 Massachusetts st., Lawrence, Kan.
LEMBERGER, JOSEPH L.,
5 N. Ninth st., Lebanon, Pa.
Leslie, William A.,
Morganton, N. C.
Lester, Leon T.,
902 N. Garrison ave., St. Louis, Mo.
Leverty, John A.,
1655 Main st., Bridgeport, Conn.
Levinson, Joseph,
11 Main st., Napa, Cal.
Levy, Adolph,
996 Broadway, Brooklyn, N. Y.
Levy, William M.,
1382 Magazine st., New Orleans, La.
Lewis, Ernest G.,
701 Centre st., Jamaica Plain, Mass.
Lichthardt, George H. P.,
1800 M st., Sacramento, Cal.
Liersch, Clemens,
307 Walnut st., Kansas City, Mo.
Lillie, Foress B.,
204 Harrison ave., Guthrie, Okla. Ter.
Lilly, Josiah K.,
Indianapolis, Ind.
Lindly, John M.,
Winfield, Henry Co., Ia.
Lindvall, Gus,
15th st. & 5th ave., Moline, Ill.
LEWELLYN, JOHN F.,
Public Square, Mexico, Audrain Co., Mo.
LLOYD, JOHN URI,
Court & Plum sts, Cincinnati, O.
Lo Sardo, Antonino,
123 Navy st., Brooklyn, N. Y.
Loehr, Theodore C.,
Carlinville, Macoupin Co., Ill.
Lohmann, Herman J.,
90 Monticello ave., Jersey City, N. J.
Loomis, John C.,
Chestnut & Watt sts., Jeffersonville, Ind.
*Lord, Thomas*,
233 Randolph st., Chicago, Ill.
Louis, Henry,
Dubuque & Washington sts., Iowa City, Ia.
Lovis, Henry C.,
2137 7th ave., New York, N. Y.
Lovvorn, James L.,
Bowdon, Ga.
Lowd, John C.,
43 Temple Place, Boston, Mass.
Lowe, Clement B.,
Phil-Ellena st. & Germant'n ave., Phila., Pa.
Lowell, Edward M.,
12 High st., Lewiston, Me.
Lueder, Fritz,
509 S. Adams st., Peoria, Ill.
Lunney, William J.,
Seneca, S. C.
Luve, Frank A. A.,
Army General Hospital, Washington, D. C.
Lyford, Earle H.,
Main & Mechanic sts., Berlin, N. H.
Lyon, Arthur G.,
Coldwater, Mich.
Lyon, George C.,
225 Westminster st., Providence, R. I.
Lyons, Albert B.,
72 Brainard st., Detroit, Mich.

Lyons, Isaac L.,
224 Camp st., New Orleans, La.
Maass, William F.,
2083 Atlantic ave., Brooklyn, N. Y.
MacFadden, Warren L.,
Care Parke, Davis & Co., Detroit, Mich.
MacRae, John Y.,
P. O. Box 66, Norfolk, Va.
Mack, George C.,
Bristol, S. Dak.
Macnair, Whitmel H.,
Main st., Tarboro, N. C.
Macy, Sherman R.,
Highland Park Normal Coll., Des Moines, Ia.
Maguire, Edward S.,
Fort Stanton, N. Mex.
MAIN, THOMAS F.,
21 Jay st., New York, N. Y.
Maisch, Henry,
711 Edmondson ave., Baltimore, Md.
Major, John R.,
800 7th st., Washington, D. C.
Mallinckrodt, Edward,
Mallinckrodt & Main sts., St. Louis, Mo.
Mann, Charles F.,
900 Woodward ave., Detroit, Mich.
Mansfield, Samuel,
1001 W. Baltimore st., Baltimore, Md.
Mares, Ferdinand L.,
20th & Pierce sts., Omaha, Neb.
Mares, Frank M.,
2876 Archer ave., Chicago, Ill.
Mariamson, Max,
165th st. & Cauldwell ave., New York, N. Y.
Marion, Etienne J.,
4239 St. Charles ave., New Orleans, La.
Markoe, George B.,
40 Rockview st., Jamaica Plain, Mass.
Martin, James,
Reyno, Ark.
Martin, John C.,
U. S. Nav. Dispensary, Washington, D. C.
Martin, Nicholas H.,
Ravenswood L. Fell, Gateshead-on-Tyne, Eng
Mason, Harry B.,
P. O. Box 484, Detroit, Mich.
Matson, Geo. H., Jr.,
662 E. Long st., Columbus, O.
Matthews, Charles E.,
221 Randolph st., Chicago, Ill.
Matthews, Loderick,
West Side Main st., Miami, Ind. Ter.
Matusow, Harry,
S. W. cor. 3d st. & Columbia ave., Phila., Pa.
May, Charles C.,
3341 Lucas ave., St. Louis, Mo.
May, Edward,
U. S. Naval Hospital, Norfolk Va.
May, James O.,
Water st., Naugatuck, Conn.
May, Louis,
1359 Third ave., Brooklyn, N. Y.
Mayo, Caswell A.,
66 W. Broadway, New York, N. Y.
Mayo, Frederick W.,
Residence Unknown.
McAdams, Harry K.,
Main & Upper sts., Lexington, Ky.
McCauley, Charles E.,
103 Marion st., Oak Park, Ill.
McConnell, Chas. H.,
84 State st., Chicago, Ill.
McCormick, Louis C.,
212 W. DeSoto st., Lake City, Fla.
McCrary, Walter H.,
Jeffersonville, Ga.
McElhenie, Thomas D.,
259 Ryerson st., Brooklyn, N. Y.
McGill, John T.,
Vanderbilt University, Nashville, Tenn.
McIlravy, Maude J. (Miss),
Magnolia, O.
McIntyre, Ewen,
303 W. 17th st., New York, N. Y.
McIntyre, Ewen, Jr.,
992 Sixth ave., New York, N. Y.
McIntyre, William,
2429 Frankford ave., Philadelphia, Pa.
McKay, Felix E.,
Duval st., Troupe, Tex.
McKenzie, Hugh H.,
392 Cedar ave., Cleveland, O.
McKesson, G. Clinton,
91 Fulton st., New York, N. Y.
MCKESSON, JOHN, JR.,
91 Fulton st., New York, N. Y.
McKinney, Robert S.,
Taneytown, Md.
McLarty, Colin,
Navy Yard Dispensary, Norfolk, Va.
McMahon, Joseph,
248 Clermont ave., Brooklyn N. Y.
McNair, John S.,
Ashland, Jackson Co., Ore.

*McPherson, George,*
Blue Island, Ill.
Meissner, Frederick W., Jr.,
820 Main st., La Porte, Ind.
*Mellor, Alfred,*
2130 Mt. Vernon st., Philadelphia, Pa.
Menk, Charles W.,
106 Market st., Newark, N. J.
Mente, Alvin W.,
125 E. 3d st., Kansas City, Mo.
Mentzer, Harvey H.,
245 W. Chelton ave., Germ'nt'n, Phila., Pa.
Mercer, Wm. E.,
Barry, Pike Co., Ill.
Meredith, H. Lionel,
319 Washington st., Hagerstown, Md.
Merrell, Charles G.,
5th & Butler sts., Cincinnati, O.
Merrell, George,
5th & Butler sts., Cincinnati, O.
Merrell, George R.,
620 Washington ave., St. Louis, Mo.
Merrell, Hubert S.,
N. E. cor. 4th & Market sts., St. Louis, Mo.
Merrem, Charles D.,
1050 N. Taylor ave., St. Louis, Mo.
Methudy, Joseph P.,
2759 Russell ave., St. Louis, Mo.
Metz, Abraham L.,
Prytania st., New Orleans, La.
Metzger, Matthias C.,
1915 Washington ave., Cairo, Ill.
Meyer, Charles L.,
1531 Madison ave., Baltimore, Md.
MEYER, CHRISTIAN F. G.,
4th st. & Clark ave., St. Louis, Mo.
Meyer, Martin M.,
118 N. Main st., South Bend, Ind.
Meyer, Theodore F.,
4th st. & Clark ave., St. Louis, Mo.
Michaelis, Gustavus,
1 Myrtle ave., Albany, N. Y.
Michalek, John,
1616 Otto Boulevard, Chicago Heights, Ill.
Michels, Victor C.,
W. Side Square, Albion, Ill.
Mieding, Albert E.,
1701 State st., Milwaukee, Wis.
Mikkelsen, Niels,
Cherokee, Ia.
Millard, David R.,
2200 E. Baltimore st., Baltimore, Md.
MILLER, ADOLPH W.,
3d & Callowhill sts., Philadelphia, Pa.
Miller, Charles,
Santa Rosa Quarantine, Pensacola, Fla.
Miller, Chas. E.,
Albion, Noble Co., Ind.
Miller, Emerson R.,
Polytechnic Inst., Auburn, Ala.
Miller, Frederick J.,
430 Cedar st., Cleveland, O.
Miller, Frederick W.,
Homestead, Ia.
Miller, Herman,
Room Q, 4th Army B'ld'g, New York, N. Y.
Miller, Jacob A.,
2d & Chestnut sts., Harrisburg, Pa.
Miller, T. Ashby,
519 E. Broad st., Richmond, Va.
MILLIGAN, DECATUR,
509 N. 2d st., Philadelphia, Pa.
Milligan, John D.,
U.S.S. FishHawk, c.o. FishCom'n, Wash., D.C.
Miner, Maurice A.,
2421 Dearborn st., Chicago, Ill.
Minnick, William G.,
1410 Monteray st., Allegheny, Pa.
Mitchell, Francis D.,
23d st. & Benton B'l'v'd, Kansas City, Mo.
Mitermiler, John A.,
1251 Willson ave., Cleveland, O.
Mittelbach, William,
114 Main st., Boonville, Mo.
Mix, Willis L.,
871 Chapel st., New Haven, Conn.
Moerk, Frank X.,
646 E. Chelton ave., Philadelphia, Pa.
*Moith, Augustus T.,*
1 Ferry st., Fishkill, N. Y.
*Molwitz, Ernest,*
2707 8th ave., New York, N. Y.
Monaghan, Thomas F.,
2630 E. Lehigh ave., Philadelphia, Pa.
Montgomery, Harriet F. (Miss),
Morton, Kan.
MOORE, GEORGE,
26 Market st., Somersworth, N. H.
MOORE, JOACHIM B.,
13th & Lombard sts., Philadelphia, Pa.
Moore, John T.,
932 Rhode Island st., Lawrence, Kan.
Moore, Josh F.,
4th st., Meridian, Miss.

Moore, Silas H.,
525 4th st., Sioux City, Ia.
Morgan, Aylmer L.,
Washington & Adams sts., Camden, Ark.
Morgan, Charles,
1300 N. Caroline st., Baltimore, Md.
Morris, George A.,
Fort Stanton, N. Mex.
Morris, Henry M.,
919 Grand River ave., Detroit, Mich.
MORRIS, LEMUEL I.,
720 N. Broad st., Philadelphia, Pa.
Morris, Max,
503 4th st., Macon, Ga.
Morrison, Joseph F.,
P. O. Box 683, Montreal, Can.
Morrison, William W.,
117 College st., Iowa City, Ia.
Morse, Edward W.,
Townly Park, Mt. Vernon, Ill.
Morse, Frank D.,
62 Elm st., Portland, Me.
Mosely, Lawrence J.,
703 Franklin st., Tampa, Fla.
Mosher, William W.,
13 Colony st., Meriden, Conn.
Moyer, Lewis N.,
Robesonia, Pa.
Mueller, Adolphus,
Cherry st., Highland, Ill.
Mueller, Ambrose,
Bristol Bldg., Webster Groves, Mo.
Muench, Wm.,
608 N. Salina st., Syracuse, N. Y.
Muir, John D.,
73 Monroe st., Grand Rapids, Mich.
Mulford, Henry K.,
412 S. 13th st., Philadelphia, Pa.
Murphy, John S.,
Union Block, Pontiac, Ill.
Murray, Alexander,
San Jose de Costa Rica.
Murray, Benjamin L.,
Care Merck & Co., New York, N. Y.
Muth, George L.,
222 W. Camden st, Baltimore, Md.
Muth, John C.,
222 W. Camden st., Baltimore, Md.
Muth, John S.,
222 W. Camden st., Baltimore, Md.
Mutty, Walter C.,
Main st., Oldtown, Me.

Myers, Daniel,
111 Water st., Cleveland, O.
Myers, Preston B.,
1523 Farnam st., Omaha, Neb.
Nachtwey, Frank J.,
1347 Clay st., Dubuque, Ia.
Nattans, Arthur,
Lexington & Howard sts., Balto., Md.
Naylor, William W.,
Holton, Jackson Co., Kan.
Neeley, Guy M.,
254 11th st. S. E., Washington, D. C.
Nelson, Burt E.,
Binghamton State Hosp., Binghamton, N. Y.
Neu, Daniel A.,
312 Main st., Union, N. J.
Neville, William R.,
915 Colorado st., Austin, Tex.
NEWMAN, GEORGE A.,
5th & Walnut sts., Louisville, Ky.
Nichols, Thomas B.,
180 Essex st., Salem, Mass.
Niece, Frederic E.,
1020 3d ave., New York, N. Y.
Nielson, John,
Ortonville, Minn.
Nixon, Charles F.,
Leominster, Mass.
Noll, Martin J.,
925 Goodfellow ave., St. Louis, Mo.
Noll, Mathias,
605 Atchison st., Atchison, Kan.
Nordmann, Herman,
1737 Druid Hill ave., Baltimore, Md.
Norton, George E.,
223 Putnam ave., Cambridgeport, Mass.
O'Connell, Charles J.,
652 Monroe ave., Detroit, Mich.
O'Gorman, Theophilus V.,
U. S. Marine Hospital, New Orleans, La.
O'Hare, James,
6 Benefit st., Providence, R. I.
O'Neil, Henry M.,
888 Columbus ave., New York, N. Y.
Oertel, Alfred A.,
84 Auburn st., Cleveland, O.
Oetinger, Albert,
967 N. 5th st., Philadelphia, Pa.
Ogier, John M.,
816 Wheeling ave., Cambridge, O.
Ogier, William R.,
1365 Bryden Road, Columbus, O.

Ohliger, Lewis P.,
23 W. Liberty st., Wooster, O.
Ohliger, Willard,
51 Hendrie ave., Detroit, Mich.
Oldberg, Oscar,
Northwestern Univ. Bldg., Chicago, Ill.
Oleson, Olaf M.,
Fort Dodge, Ia.
*Oliff, James H.,*
200 Arlington ave., Plainfield, N. J.
Oliver, William M.,
132 Broad st., Elizabeth, N. J.
Orne, Joel S.,
493 Main st., Cambridgeport, Mass.
Ortiz, Miguel A.,
115 Prado st., Havana, Cuba.
Orton, Ingomar F.,
2113 Market st., Galveston, Tex.
Osseward, Cornelius,
c. o. Stewart, Holmes & Co., Tacoma, Wash.
Oster, Frank C.,
1261 St. Clair st., Cleveland, O.
Osterlund, Otto W.,
46th st. & Baltimore ave., Philadelphia, Pa.
Ottinger, James J.,
20th & Spruce sts., Philadelphia, Pa.
Otto, John N. W.,
76 S. Rampart st., New Orleans, La.
Otto, Theodor G. E.,
402 Washington st., Columbus, Ind.
Overton, Burr M.,
2010 First st., Louisville, Ky.
Owens, Richard J.,
Myrtle ave. & Spencer st., Brooklyn, N. Y.
Paddock, Morris V.,
Union st., St. John, N. B., Can.
Palmer, John D.,
Monticello, Fla.
Parisen, George W.,
Smith & High sts., Perth Amboy, N. J.
Parker, Frederick M.,
364 Wabasha st., St. Paul, Minn.
Parmalee, Walter W.
P. O. Box 336, Lewiston, Me.
Parsons, Chas. W.,
156 Fifth ave., New York, N. Y.
Parsons, John,
194 31st st., Chicago, Ill.
Partridge, Frank R.,
Water st., Augusta, Me.
Patch, Edgar L.,
P. O. Box 639, Stoneham, Mass.
Patch, James A.,
Syrian Protestant College, Beirût, Syria.
Patrick, Elmer A.,
615 Main st., Sharpsburg, Pa.
Patten, Eustis,
154 W. Main st., Carbondale, Ill.
*Patten, I. Bartlett,*
594 Washington st., Boston, Mass.
*Patterson, Theodore H.,*
3640 Cottage Grove ave., Chicago, Ill.
Pattison, George H.,
88 S. Market st., Chicago, Ill.
Patton, John F.,
273 W. Market st., York, Pa.
Pauley, Frank C.,
939 Ailanthus ave., St. Louis, Mo.
Payne, George F.,
43½ Whitehall st., Atlanta, Ga.
Peacock, Bertha L. (Mrs.),
2012 S. 10th st., Philadelphia, Pa.
Peacock, Josiah C.,
2012 S. 10th st., Philadelphia, Pa.
Pearce, Howard A.,
370 Elmwood ave., Providence, R. I.
Pearman, Wm. E.,
U.S.T.S., Pensacola, Sta. D, San Francisco, Cal.
Pearson, Joseph F.,
U. S. Naval Station, Newport, R. I.
Pease, Autumn V.,
Fairbury, Neb.
Peck, George L.,
Hall of Pharmacy, Jamaica, N. Y.
Peck, Percy S.,
90 Jefferson ave., Grand Rapids, Mich.
Pennock, Edward,
52 Maiden Lane, New York, N. Y.
Perkins, Benjamin A.,
94 Commercial st., Portland, Me.
Perkins, C. William,
1 East Main st., Waterbury, Conn.
Perkins, George H.,
Water st., North Andover Depot, Mass.
Perry, Frederick W. R.,
709 Woodward ave., Detroit, Mich.
Peter, Minor C.,
832 Sixth st., Louisville, Ky.
Peters, Henry A.,
Oconomowoc, Wis.
Peterson, John N.,
202 Ave. D, Bayonne, N. J.
Petsche, Bismark Wm.,
Arlington Chemical Co., Yonkers, N. Y.

PETTIT, HENRY M.,
15 S. Main st., Carrollton, Mo.
Pfaff, Franz,
871 Boylston st., Boston, Mass.
Pfafflin, Henry A.,
Patton ave. & Church st., Asheville, N.C.
Pfeffer, William J.,
1301 Geyer ave., St. Louis, Mo.
Pfluger, Henry C.,
P. O. Box 307, Honolulu, H. I.
Philibert, Leon D.,
2631 Gamble st., St. Louis, Mo.
Phillips, Carrie E. (Miss),
81 Concord ave., Cambridge, Mass.
Pieck, Edward L.,
cor. 6th & Main sts., Covington, Ky.
Pierce, Fred,
6th & Edmond sts., St. Joseph, Mo.
Pierce, William H.,
316 Shawmut ave., Boston, Mass.
Pile, Gustavus,
770 Passyunk ave., Philadelphia, Pa.
Pilkington, William B.,
1016 N. Garrison ave., St. Louis, Mo.
Pilson, Abram O.,
1327 W. Baltimore st., Baltimore, Md.
Pine, Warren C.,
Riverside, Burlington Co., N. J.
Pippert, Nicholas J.,
Jefferson ave. & Cherokee st., St. Louis, Mo.
Pirie, Alfred M.,
Calle Real, Cartago, Costa Rica, A. C.
Pitt, John R.,
218 Main st., Middletown, Conn.
Pitts, William B.,
25 E. Cain st., Atlanta, Ga.
Placak, Harry,
81 Daisy ave., Cleveland, O.
Plaut, Albert,
128 William st., New York, N. Y.
Pond, Raymond H.,
87 Lake st., Chicago, Ill.
Poole, William E.,
25 State st., Montpelier, Vt.
Porter, Chilton S.,
Somerset, Pulaski Co., Ky.
PORTER, HENRY C.,
Main & Pine sts., Towanda, Pa.
Post, Arthur E.,
458 9th st., Brooklyn, N. Y.
Potts, David G.,
224 Market st., Philadelphia, Pa.
Powell, William C.,
Snow Hill, Md.
Powell, William D.,
Excello, Macon Co., Mo
POWER, FREDERICK B.,
6 King st., Snow Hill, London, Eng.
Prall, Delbert E.,
201 Genesee ave., Saginaw, Mich.
Preissler, Henry W.,
Shelbyville, Ky.
PRESCOTT, ALBERT B.,
University of Michigan, Ann Arbor, Mich.
Preston, Andrew P.,
2 Congress Block, Portsmouth, N. H.
Price, Charles H.,
226 Essex st., Salem, Mass.
Price, Joseph,
226 Essex st., Salem, Mass.
Pringle, James M.,
977 8th ave., New York, N. Y.
Printup, Daniel,
812 Broad st., Augusta, Ga.
Prutzman, Charles O.,
104 S. Walnut st., Muncie, Ind.
Puckner, William A.,
73 Wells st., Chicago, Ill.
Punch, William F.,
71 Dauphin st., Mobile, Ala.
Pursel, Robert C.,
Care Wm.S.Merrell Chem. Co.,Cincinnati,O.
Quackinbush, Benjamin F.,
703 Greenwich st., New York, N. Y.
Quandt, Arthur A.,
Howard & Lombard sts., Baltimore, Md.
Quandt, Ernest E.,
Howard & Lombard sts., Baltimore, Md.
Quigley, Richard L.,
2036 G st. N. W., Washington, D. C.
Quinn, Frank W.,
1117 S. Franklin st., New Orleans, La.
Quintanal, Fernandez B. J.,
7th ave. & 14th st.,Ybor City,Tampa,Fla.
Raeuber, Edward G.,
44 Johnson st., Milwaukee, Wis.
Rains, A. Brown,
11 W. 7th st., Columbia, Tenn.
Ramsaur, David W.,
201 Lemon st., Palatka, Fla.
RAMSPERGER, GUSTAVUS,
212 E. 18th st., New York, N. Y.
Rand, Daniel M.,
Main & Depot sts., S. Windham, Me.

Randall, Frank O.,
101 N. Main st., Brockton, Mass.
*Rano, Charles O.*,
275 Niagara st., Buffalo, N. Y.
Rapelye, Charles A.,
853 Main st., Hartford, Conn.
Raubenheimer, Otto,
1341 Fulton st., Brooklyn, N. Y.
Rauschenberg, Sidney,
29 S. 12th ave., Mount Vernon, N. Y.
Rauschkolb, John,
251 S. 4th st., Columbus, O.
Reade, Frank M.,
307 E. Grace st., Richmond, Va.
Redsecker, Jacob H.,
810 Cumberland st., Lebanon, Pa.
Reed, Willoughby H.,
Marshall & Astor sts., Norristown, Pa.
Reeves, Sidney H.,
Seven Corners, St. Paul, Minn.
Reidy, Michael,
Shiawassee ave., Corunna, Mich.
Reilly, Robert C.,
3300 Meramec st., St. Louis, Mo.
Reimann, George,
405 Genesee st., Buffalo, N. Y.
Remington, J. Percy,
36 Doughty st., Brooklyn, N. Y.
REMINGTON, JOSEPH P.,
1832 Pine st., Philadelphia, Pa.
Renshaw, Thomas W.,
Lansford, Carbon Co., Pa.
Reymond, John P.,
1010 Broadway, Kansas City, Mo.
Reynolds, Charles E.,
U.S.R.SColumbia,NavyYard,NewYork,N.Y.
Reynolds, John J.,
Water & Main Cross sts., Flemingsburg, Ky.
Rhode, Rudolph E.,
504 N. Clark st., Chicago, Ill.
Rhodes, Chas. O.,
4 Main st., Groton, N. Y.
Rich, W. Pitt,
Grove ave., Verona, Essex Co., N. J.
Richardson, Edwin S.,
520 N. Washington st., Marshall, Tex.
Richardson, Horatio S.,
Main st., Concord, Mass.
Richardson, Samuel W.,
3 B st. S. E., Washington, D. C.
Richardson, Thomas L.,
211 W. 25th st., Baltimore, Md.
Richardson, Willard S.,
316 4½ st. S. W., Washington, D. C.
Riddell, Benjamin F.,
8 Granite Block, Fall River, Mass.
*Ridgway, Lemuel A.*,
Box 1111, Boone, Ia.
Ridgway, William F.,
1101 Atlantic ave., Atlantic City, N. J.
Riess, Herman W.,
Hosp.Corps,U.S.A.,Fort Leavenworth, Kan.
Riggio, Joseph,
cor. 8th & 17th sts., Tampa, Fla.
Riley, Cassius M.,
Alton, Ill.
Riley, Russell,
1400 Olive st., St. Louis, Mo.
*Rittenhouse, Henry N.*,
1705 N. 17th st., Philadelphia, Pa.
Roberts, James F.,
Parkhill, Ontario, Can.
Robertson, Felix O.,
Box 998, Portland, Ore.
Robins, Wilbur F.,
28 Main st., Littleton, N. H.
ROBINSON, JAMES S.,
2d & Madison sts., Memphis, Tenn.
Robinson, William J. M.,
119 E. 128th st., New York, N. Y.
Rockefeller, Howard,
653 Granite st., Butte, Mont.
Rockefeller, Lucius,
Palisade ave., Englewood, N. J.
Rodenmoyer, William E.,
736 5th ave., McKeesport, Pa.
Roe, J. Newton,
College ave. & Locust st , Valparaiso, Ind.
Roehrig, Albert M.,
U. S. M. Hosp., Stapleton, Staten Is., N. Y.
Roeller, Edward F.,
Velasco, Tex.
Roesch, Anton,
1311 Michigan ave., Chicago, Ill.
Rogers, Anthony C.,
139 Prospect st., Gloucester, Mass.
Rogers, Arthur H.,
Geneseo, Livingston Co., N. Y.
Rogers, Edward,
U. S. M. Hosp., Cincinnati, O.
Rogers, William H.,
North st., Middletown, N. Y.
Rogg, Charles W.,
511 Wal st., Des Moines, Ia.

*Rollins, John F.*,
7 Hamilton st., Dover, N. H.
Rose, Herman L.,
Columbia, Ill.
Rosengarten, George D.,
1700 Fitzwater st., Philadelphia, Pa.
Rosenthal, David A.,
Gay & Depot sts., Knoxville, Tenn.
Rosenzweig, Benj.,
624 Fulton st., Brooklyn, N. Y.
Roth, Charles R.,
333 E. Tuscarawas st., Canton, O.
Rowell, Samuel J.,
Main st.&Broadway, Excelsior Spgs., Mo.
Rowlinski, Robert A.,
104 Broughton st., Savannah, Ga.
Ruddiman, Edsel A.,
Vanderbilt Univ., Nashville, Tenn.
Ruenzel, Henry G.,
753 3d st., Milwaukee, Wis.
Ruhl, Harry F.,
Manheim, Lancaster Co., Pa.
RUMSEY, SAMUEL L.,
Fort & Hotel sts., Honolulu, H. I.
RUNYON, EDWARD W.,
11 W. 42d st., New York, N. Y.
Ruppert, John,
Price Hill, Cincinnati, O.
Rusby, Henry H.,
115 W. 68th st., New York, N. Y.
Ryan, Frank G.,
151 Joseph Campau ave., Detroit, Mich.
Ryerson, Maurice W.,
3643 Charles st., Omaha, Neb.
Sadtler, Samuel P.,
N. E. cor. 10th & Chestnut sts., Philad'a, Pa.
Samson, Max,
117 Camp st., New Orleans, La.
SANDER, ENNO,
2801–2811 Lawton ave, St. Louis, Mo.
Sanford, John F.,
28 Lisbon st., Lewiston, Me.
SARGENT, EZEKIEL H.,
106 Wabash ave., Chicago, Ill.
Sauerhering, Edward,
Mayville, Dodge Co., Wis.
Sauerhering, Rudolph A.,
Main st., Mayville, Dodge Co., Wis.
SAUNDERS, WILLIAM,
Central Experim. Farm, Ottawa, Can.
Sauvinet, Chas. D.,
238 Villere st., New Orleans, La.
Sawyer, Charles H.,
52 Main st., Saco, Me.
Sawyer, William F.,
1152 Tremont st., Boston, Mass.
Sayre, Edward A.,
100 Henry st., Orange, N. J.
Sayre, Lucius E.,
University of Kansas, Lawrence, Kan.
Scarboro, Turner A.,
R. R. st. S., Lyons, Ga.
Schadt, Conrad,
Amana, Ia.
Schaefer, Emil A.,
1436 Fifth ave., Pittsburg, Pa.
Schafer, George H.,
713 Front st., Fort Madison, Ia.
Schaffer, Charles,
Naval Hospital, Brooklyn, N. Y.
SCHEFFER, HENRY W.,
Care of Larkin & Scheffer, St. Louis, Mo.
Schenk, Henry,
80 Washington Sq., New York, N. Y.
Scherer, Andrew,
383 N. State st., Chicago, Ill.
Scherling, Gustav,
1201 4th st., Sioux City, Ia.
Schieffelin, William J.,
170 William st, New York, N. Y.
Schiemann, Edward B.,
M. & Walnut sts., Louisville, Ky
Schimpf, Henry W.,
404 W. 34th st., New York, N. Y.
Schleussner, Chas. F.,
198 Ninth ave., New York, N. Y.
Schlosser, Peter,
124 W. Chestnut st., Louisville, Ky.
Schlotterbeck, Augustus G.,
36 Brown st., Portland, Me.
Schlotterbeck, Julius O.,
1319 Israel ave., Ann Arbor, Mich.
Schmid, Henry,
38 Ave. A., New York, N. Y.
Schmidt, Charles,
2906 Parkwood ave., Baltimore, Md.
Schmidt, Ferdinand T.,
Ave. C. & 15th st., Flatbush, Brooklyn, N. Y.
Schmidt, Florian C.,
7123 Cottage Grove ave., Chicago, Ill.
Schmidt, Frederick M.,
1107 Schiller Building, Chicago, Ill.
Schmidt, Joseph H.,
2402 Cuming st., Omaha, Neb.

Schmidt, Valentine,
Polk & Jackson sts., San Francisco, Cal.
Schmidt, Walter K ,
84 Canal st., Grand Rapids, Mich.
Schmitt, George J. F.,
507 W. Commerce st., San Antonio, Tex.
Schmitter, Jonathan,
Maple st., Gypsum City, Saline Co., Kan.
Schneider, Albert,
Calif. Coll. Pharm., San Francisco, Cal.
Schoenhut, Christie H.,
199 Superior st., Cleveland, O.
Schoenthaler, John P.,
1800 Sidney st., St. Louis, Mo.
Schoettlin, Albert J.,
4th & Chestnut sts., Louisville, Ky.
Schrader, August C.,
Elliot & Curley sts., Baltimore, Md.
Schrank, C. Henry,
437 E. Water st., Milwaukee, Wis.
Schreiber, August,
8th & Humboldt sts., Tell City, Ind.
Schreiner, Oswald,
Bureau Soils, Dept. Agriculture, Wash., D. C.
Schrodt, Jacob,
106 S. Francis st., Terrell, Tex.
Schueller, Frederick W.,
232 S. High st., Columbus, O.
Schuh, Paul G.,
607 Commercial ave., Cairo, Ill.
Schulze, Louis,
631 S. Patterson Park ave., Baltimore, Md.
Schumann, Otto G.,
837 N. Caroline st., Baltimore, Md.
Schutz, Chris,
Madison, S. Dak.
Scott, George T.,
Franklin Square, Worcester, Mass.
Scott, William H.,
1617 17th st., Richmond, Va.
Scoville, Wilbur L.,
St. Botolph & Garrison sts., Boston, Mass.
SEABURY, GEORGE J.,
59 Maiden Lane, New York, N. Y.
Searby, William M.,
400 Sutter st., San Francisco, Cal.
Seaverns, Martha G. (Miss),
81 Concord ave., Cambridge, Mass.
Seidel, John H.,
Masonic Block, Biddeford, Me.
Seinsoth, John J.,
11 Main st., Hartford, Conn.
Seitz, Lorenz A.,
736 S. 4th st., St. Louis, Mo.
Seltzer, Leonard A.,
Room 6, 32 Adams ave. W., Detroit, Mich.
Selzer, Eugene R.,
1751 Superior st., Cleveland, O.
Sempill, Walter M.,
135 Clark st., Chicago, Ill.
Semple, Henry B., Jr.,
233 Northampton st., Easton, Pa.
Sennewald, Emil A.,
800 Hickory st., St. Louis, Mo.
Serodino, Herman,
5th & Walnut sts., Cincinnati, O.
Settle, James A.,
Yukon, Okla. Ter.
Seymour, James,
Norman, Okla. Ter.
Shafer, Erwin C.,
Green Lane & York Road, Philadelphia, Pa.
*Sharp, Alpheus P.*,
Pratt & Howard sts., Baltimore, Md.
Sharp, Sol. A.,
1845 Polk st., San Francisco, Cal.
Sharples, Stephen P.,
26 Broad st., Boston, Mass.
SHEPPARD, SAMUEL A. D.,
1129 Washington st., Boston, Mass.
Sherman, Charles R.,
cor. 16th & Dodge sts., Omaha, Neb.
Sherrard, Charles C.,
Angola, Ind.
Sherwood, Henry J.,
979 Woodland ave., Cleveland, O.
SHINN, JAMES T.,
Broad & Spruce sts., Philadelphia, Pa.
Shoemaker, Clayton F.,
511 Arch st., Philadelphia, Pa.
SHOEMAKER, RICHARD M.,
4th & Race sts., Philadelphia, Pa.
Shoults, Robert G.,
Sonoma, Cal.
Shrader, William E.,
132 Clinton st., Iowa City, Ia.
Shreve, John A.,
Main st., Port Gibson, Miss.
SHURTLEFF, ISRAEL H.,
195 Fourth st., New Bedford, Mass.
Shwab, George A.,
Nashville, Tenn.
Siebe, Henri O.,
Care Lumberton Drug Co., Lumberton, Miss.

Siegenthaler, Harvey N.,
22 E. High st., Springfield, O.
Sieker, Ferdinand A.,
120 William st., New York, N. Y.
Sills, Fred. W.,
1914 Evanston ave., Chicago, Ill.
Simenstad, Martin O.,
Edmore, N. Dak.
Simmons, Frank B.,
182 Main st., Woonsocket, R. I.
Simmons, Gustav T.,
Gilt Edge, Mont.
Simms, Giles G. C.,
1344 New York ave., Washington, D. C.
Simon, William,
1348 Block st., Baltimore, Md.
Simonson, William,
126 W. 9th st., Cincinnati, O.
Simpson. William,
101 Fayetteville st., Raleigh, N. C.
Sims, Henry U.,
Longview, Tex.
Simson, Francis C.,
Pentagon Bldg., Halifax, N. S.
Skelly, James J.,
339 E. 14th st., New York, N. Y.
Slade, Harry A.,
10 State st., Montpelier, Vt.
Slater, Frank H.,
P.O.Box 10, Matawan, Monmouth Co., N. J.
Sloss, Robert A.,
Pharmacist,Clinton Prison,Dannemora,N.Y.
Small, Herbert E.,
2494 Washington st., Boston, Mass.
Smallwood, W. Thornton,
430 W. Adams st., Chicago, Ill.
Smith, Albert H.,
3428 Frankford ave., Philadelphia, Pa.
Smith, B. Frank,
433 Market st., Harrisburg, Pa.
Smith, Clarence P.,
861 Broad st., Newark, N. J.
Smith, Edward J.,
158 Eddy st., San Francisco, Cal.
Smith, Edward N.,
93 Main st., Thompsonville, Conn.
Smith, Edward W.,
764 W. 4th st., Williamsport, Pa.
Smith, Francis M.,
158 Wentworth st., Charleston, S. C.
Smith, George W.,
4301 Laclede ave., St. Louis, Mo.
Smith, Harley E.,
8th & Main sts., Riverside, Cal.
Smith, James A.,
Care Mallinckrodt Chem.W'ks,St.Louis,Mo.
Smith, J. Schall,
7 E. Market st., York, Pa.
Smith, J. Stovall,
301 Newcastle st., Brunswick, Ga.
Smith, Lauriston S.,
King st., St. Augustine, Fla.
Smith, Linville H.,
701 Centre st., Jamaica Plain, Mass.
Smith, Oliver V. R.,
3620 3d st., Des Moines, Ia.
Smith, Otis W.,
5th & Engineer sts., Sedalia, Mo.
Smith, Reuben R.,
901 7th ave., New York, N. Y.
Smith, Theodric,
1343 Pennsylvania ave., Baltimore, Md.
Smith, Walter V.,
2d & Green sts., Philadelphia, Pa.
Smith, White G.,
Asheville, N. C.
Smith, Willard A.,
Main st., Richfield Springs, N. Y.
Smithson, David E.,
Emmett, Canyon Co., Idaho.
Sniteman, Charles C.,
Neillsville, Clark Co., Wis.
Snodgrass, Latta K.,
120 Main st., Little Rock, Ark.
Snow, Charles W.,
214 Warren st., Syracuse, N. Y.
Snow, Clyde M.,
358 Dearborn st., Chicago, Ill.
*Snyder, Ambrose C.*,
13½ St. Felix st., Brooklyn, N. Y.
Sohrbeck, G. Henry,
3d ave. & 16th st., Moline, Ill.
Sohrbeck, George W.,
1601 3d ave., Moline, Ill.
Solomons, Isaiah A.,
163 Congress st., Savannah, Ga.
Sombart, John E.,
Wilmore, Kan.
Sords, Thomas V.,
315 Pearl st., Cleveland, O.
Sorency, Robert,
Warrensburg, Mo.
Southard, Frank A.,
HygienicLab'tory,P.H.&M.H.S.,Wash.,D.C.

Spalding, Warren A.,
89 Church st., New Haven, Conn.
Spangler, Lewis C.,
P.H.&M.H.S. Tampa Bay Quar., Tampa, Fla.
Sparks, James M.,
718 Garrison ave., Fort Smith. Ark.
Speer, Charles C,
St. Augustine, St. John's Co., Fla.
Speissegger, Walter L.,
460 Meeting st., Charleston, S. C.
Sperry, Herman J.,
633 Chapel st., New Haven, Conn.
Spilker, Hermann F. A.,
1801 Chouteau ave., St. Louis, Mo.
Sprague, Wesson G.,
Main st., Flushing, Mich.
Sprissler, Clara (Miss),
601 S. 9th st., Philadelphia, Pa.
Squibb, Charles F.,
Bernardsville, N. J.
Squibb, Edward H.,
36 Doughty st., Brooklyn, N. Y.
St. Jacques, Gaston,
St. Hyacinthe, Que., Can.
St. John, Sydney S.,
Lakota, N. Dak.
Stacey, Benjamin F.,
Thompson Square, Charlestown, Mass.
Stacy, Marion F.,
5 W. Sale st., Tuscola, Ill.
Staehle, Louis L.,
169 S. Orange ave., Newark, N. J.
Stahl, Amanda W. (Miss),
22 Alaska st., Chicago, Ill.
Stahlhuth, Ernst H. W.,
5th & Washington sts., Columbus, Ind.
Stamford, William H.,
256 Mulberry st., Newark, N. J.
Stamm, Dante M.,
Geneseo, Ill.
Stange, Carl F.,
3214 25th st., San Francisco, Cal.
Staudt, Louis C.,
15 S. Broadway, Aurora, Ill.
Stearns, Frederick,
371 Lafayette ave, Detroit, Mich.
Stearns, William L.,
378 Washington st., New York, N. Y.
Steele, James G.,
1120 Gough st., San Francisco, Cal.
Stegner, Emil,
Grand & Easton aves., St. Louis, Mo.
Stein, Edward T. N.,
217 Montgomery st., Jersey City, N. J.
Stein, Jacob H.,
801 Penn st., Reading, Pa.
Steinmeyer, William O.,
Carlinville, Ill.
Stephenson, Charles W.,
U. S. M. Hospital, Chicago, Ill.
Sterett, Walter B.,
Care Cooper Drug Compy., Joplin, Mo.
Stevens, Alviso B.,
915 Oakland ave., Ann Arbor, Mich.
Stevens, Edward,
901 Pennsylvania ave., Washington, D. C.
Stevens, Frederick S.,
Auburn, Cal.
Stewart, Aaron W.,
8th st. & University Place, New York, N. Y.
Stewart, Francis E.,
Care C. E. Worden & Co., San Francisco, Cal.
Stewart, Harry E.,
639 W. Bay st, Jacksonville, Fla.
Stier, Carl,
Marine Hospital, Key West, Fla.
Stille, Adolph H.,
3852 Flora ave., St. Louis, Mo.
Stockton, Robert C.,
Main & 2d sts., Richmond, Ky.
Stoddart, Thomas,
84 Seneca st., Buffalo, N. Y.
Stolle, Henry J.,
4th & Market sts., St. Louis, Mo.
Stone, Clarence G.,
273 Rich ave, Mt. Vernon, N. Y.
Stone, Sarah E. (Miss),
Jones City, Okla. Ter.
Stormes, John E.,
Lancaster, Garrard Co., Ky.
Stott, Samuel T.,
505 Penna. ave. N. W.. Washington, D. C.
Stoughton, Dwight G.,
204 State st., Hartford, Conn.
Stowell, Daniel,
1045 Washington st., Boston, Mass.
Streett, Edmund O.,
1401 N. Charles st., Baltimore, Md.
Stroup, Freeman F.,
145 N. 10th st., Philadelphia, Pa.
Stuart, Wm. A.,
800 W. Baltimore st., Baltimore, Md.
Sturmer, Julius W.,
323 Salisbury st., Lafayette, Ind.

Stutzlen, Frank C.,
231 3d st., Elizabeth, N. J.
Sultan, Frederick W.,
4521 Forest Park Boulevard, St. Louis, Mo.
Swain, Harry,
13th & Lombard sts., Philadelphia, Pa.
Swann, Samuel V. B.,
918 Sixth ave., New York, N. Y.
Swannell, Henry.
1 Main st., Champaign, Ill.
*Sweeney, Robert O.*,
Duluth, St. Louis Co., Minn.
Sweet, Caldwell,
22 W. Market Square, Bangor, Me.
Symonds, Arthur H.,
Conneaut, Ashtabula Co., O.
Taber, Joseph M.,
Elko, Nev.
Takamine, Jokichi,
1611 Amsterdam ave., New York, N. Y.
Taylor, Augustus C.,
201 Maryland ave. N. E., Washington, D. C.
Taylor, George E.,
615 Harrison ave., Leadville, Colo.
Teeters, Wilbur J.,
Iowa Coll. Pharm., Iowa City, Ia.
Temm, William D.,
1926 N. Grand ave , St. Louis, Mo.
Terrill, Willis E.,
9 State st., Montpelier, Vt.
Thames, Joseph J.,
E. Main st., Taylor, Williamson Co., Tex.
Thelander, Chreston C.,
925 4th st., Sioux City, Ia.
Thomas, Daniel J.,
345 Wyoming ave., Scranton, Pa.
Thomas, Frank W.,
West Main st., Webb City, Mo.
Thomas, Robert, Jr.,
108 Broad st., Thomasville, Ga.
Thomasson, Anders,
277 Central st., Lowell, Mass.
Thompson, Albert D.,
101 S. Washington ave., Minneapolis, Minn.
Thompson, Edwin T.,
911 W. 7th st., Sioux City, Ia.
Thompson, Joseph,
401 W. 7th st., Sioux City, Ia.
*Thompson, William B.*,
4804 Trinity Place, W. Philadelphia, Pa.
Thorburn, Albert D.,
55 Walnut st., Chicago, Ill.
Thorn, Henry P.,
Main st., Medford, N. J.
Thurston, Azor,
Grand Rapids, Wood Co., O.
Thweatt, Archibald,
Main st., Humboldt, Tenn.
Tidball, James T.,
Main st., Brookings, S. Dak.
Tigner, James O.,
Greenville, Meriwether Co., Ga.
Tilden, Amos K.,
31 School st., Boston, Mass.
Timberlake. Arthur,
College ave. & 16th st., Indianapolis, Ind.
Tobin, John M.,
Narragansett Pier, R. I.
Todd, Albert M.,
204 N. Rose st., Kalamazoo, Mich.
Tontz, George W.,
2248 Dodier st., St. Louis, Mo.
Topley, James,
316 Georgia st., Vallejo, Solano Co., Cal.
Torbert, Willard H.,
756 Main st., Dubuque, Ia.
Traynor, Charles F.,
159 Main st., Biddeford, Me.
Treat, Joseph A.,
Stuart, Guthrie Co., Ia.
Trolinger, Ernest F.,
Bell Buckle, Tenn.
Troxel, Henry L.,
1045 N. Fulton ave., Baltimore, Md.
Troxler, Constantine, Jr.,
228 W. Breckenridge st., Louisville, Ky.
Troxler, Robert E.,
Quarantine Sta., Port Townsend, Wash.
Truax, Charles,
42 Wabash ave., Chicago, Ill.
Tucker, Greenleaf R.
City Hospital, Boston, Mass.
Turner, Adam,
Orangeville, Ont., Can.
Turnquist. Carl M.,
2458 Wentworth ave., Chicago, Ill.
Tuthill, Frederick P.,
526 Putnam ave., Brooklyn, N. Y.
Uhlich, Ferdinand G.,
2001 Salisbury st., St. Louis, Mo.
Ulch, James J.,
623 E. Scott st., Des Moines, Ia.
Vadboncoeur, Edmond L. J.,
1 St. Lawrence st., Montreal, Can.

Van Derveer, Robert H.,
Broad & Monmouth sts., Red Bank, N. J.
Van Winkle, Abraham,
35 Clinton ave., Newark, N. J.
Vanderkleed, Charles E.,
5251 Jefferson st., Philadelphia, Pa.
Vargas, Jorge,
809 Beacon st., Boston, Mass.
Varney, Edward F.,
39 Tremont st., Boston, Mass.
Vaughan, Parry W.,
106 E. Main st., Durham, Orange Co., N. C.
*Vernor, James,*
33 Woodward ave., Detroit, Mich.
Viallon, Paul L., Jr.,
White Castle, La.
Vitt, Rudolph S.,
3860 S. Broadway, St. Louis, Mo.
Vockroth, Emil,
55 Newark ave., Jersey City, N. J.
Voight, Joseph F.,
840 Market st., Chattanooga, Tenn.
VOISS, ARCADIUS,
St. Joseph Drug Co., St. Joseph, Mo.
Vordick, August H.,
Jefferson ave. & Benton st., St. Louis, Mo.
Voss, Geo. W.,
680 Woodland ave., Cleveland, O.
Votteler, William,
Shelby & Oak sts., Louisville, Ky.
Waddell, Minor T.,
1207 Ash st., Indianapolis, Ind.
Walbrach, Arthur,
1200 15th st., Denver, Colo.
Walbridge, Cyrus P.,
620 Washington ave., St. Louis, Mo.
Waldner, Paul J.,
Naval Hospital, Brooklyn, N. Y.
Walker, Alfred L.,
424 Woodward ave., Detroit, Mich.
Walker, E. Edward,
Pamplin City, Appomattox Co., Va.
Walker, John P.,
Main st., Freehold, N. J.
Walker, William J.,
74 State st., Albany, N. Y.
Wall, Otto A.,
4532 Virginia ave., St. Louis, Mo.
Wall, Otto A., Jr.,
4532 Virginia ave., St. Louis, Mo.
Walling, Rufus O.,
Lock Box 322, Keyport, N. J.
Walter, Charles A.,
129 W. Georgia st., Indianapolis, Ind.
Wangler, Conrad D.,
227 E. 4th st., Waterloo, Ia.
Wanous, Josie A. (Miss),
521 Nicollet ave., Minneapolis, Minn.
Ward, A. Jae,
107E.Pike's Peak ave.,Colorado Spr'gs,Colo.
Ward, Charles A.,
P. O. Box 460, Stoneham, Mass.
Ward, Homer B.,
Ellisville, Jones Co., Miss.
Ware, Charles H.,
1930 Madison ave., Baltimore, Md.
Warn, William E.,
Lock Box 342, Keyport, N. J.
Warner, William R., Jr.,
639 N. Broad st., Philadelphia, Pa.
Watson, Herbert K.,
803 Market st., Wilmington, Del.
Watson, Sidney P.,
137 Richardson st., Atlanta, Ga.
Watson, William Jr.,
202 Genesee st., Utica, N. Y.
Watt, George H.,
Pullman, Wash.
WAUGH, GEORGE J.,
Ontario st., Stratford, Ont., Can.
Weakley, William S.,
105 N. George st., York, Pa.
Weaver, Francis M.,
111 Main st., Oklahoma City, Okla. Ter.
Webb, William H.,
556 N. 16th st., Philadelphia, Pa.
Webber, Arthur H.,
Cadillac, Mich.
Webber, J. Le Roy,
277 Greene ave., Brooklyn, N. Y.
Weber, Peter J.,
320 S. 7th st., St. Louis, Mo.
Weidemann, Charles A.,
2148 Green st., Philadelphia, Pa.
Weidemann, George B.,
2148 Green st., Philadelphia, Pa.
Weiser, William P.,
501 Market st., Camden, N. J.
Weiss, Conrad H.,
25 Monroe st., Anacostia, D. C.
WELLCOME, HENRY S.,
Snow Hill Buildings, London, E. C., Eng.
Weller, Frank P.,
755 8th st. S. E., Washington, D. C.

Wells, Edwin H.,
1 Staniford st., Boston, Mass.
Wendel, H. Edward,
3d & George sts., Philadelphia, Pa.
Wendt, William C.,
366 S 4th st., Columbus, O.
Wenzell, William T.,
1998 Ocean Blv'd, San Francisco, Cal.
Werner, Rudolf C.,
2592 Atlantic ave., Brooklyn, N. Y.
Wescott, William C.,
Pacific & Delaware aves., Atlantic City, N. J.
Wesner, Henry C.,
Windsor, Henry Co., Mo.
West, Charles A.,
14 Fulton st., Boston, Mass.
West, Courtney H.,
620 N. 4th st., St. Louis, Mo.
Westcott, James W.,
423 N. Charles st., Baltimore, Md.
Wetterstroem, Albert,
2867 Colerain ave., Cincinnati, O.
Wetterstroem, Theodore D.,
3929 Spring Grove ave., Cincinnati, O.
Wheeler, William D.,
21 Massachusetts ave., Boston, Mass.
WHELPLEY, HENRY M.,
2342 Albion Place, St. Louis, Mo.
Whipple, George H.,
Broad & Fayette sts., Bridgeton, N. J.
Whitcomb, Frederick E.,
Washington & Garrison aves., St. Louis, Mo.
White, Charles H.,
511 Madison ave., New York, N. Y.
White, Herbert E.,
Jamestown, N. Dak.
White, Howell Cobb,
119–123 Jackson st., Hawkinsville, Ga.
Whitehead, Eugene T.,
Main st., Scotland Neck, N. C.
WHITFIELD, THOMAS,
240 Wabash ave., Chicago, Ill.
Whitney, David V.,
3722 E. 12th st., Kansas City, Mo.
Whitney, Edgar F.,
Warren, Minn.
Wichelns, Frederick,
192 Greenwich st., New York, N. Y.
Wickham, William H.,
91 Fulton st., New York, N. Y.
Wicks, Jesse H.,
Care of W. H. Simons, Forsyth, Mont.
*Wiegand, Thomas S.*,
145 N. 10th st., Philadelphia, Pa.
Wikle, Jesse L.,
1010 Noble st., Anniston, Ala.
Wilbert, Martin I.,
2811 Diamond st., Philadelphia, Pa.
Wilbur, Lot,
Ave. C & 1st st., Snohomish, Wash.
Wilcox, Levi,
22 Mitchell ave., Waterbury, Conn.
Wiley, Harvey W.,
Dept. of Agriculture, Washington, D. C.
Willard, Rowland,
131 E. Main st., Haddonfield, N. J.
Williams, George G.,
P. O. Box 3551, Boston, Mass.
Williams, John K.,
391 Main st., Hartford, Conn.
Williams, Morrison P.,
Trade & Tyron sts., Charlotte, N. C.
Williams, Richard W.,
Notre Dame st., Three Rivers, Que., Can.
Williams, Seward W.,
8 Brighton ave., East Orange, N. J.
Williamson. Lee,
330 W. Baltimore st., Baltimore, Md.
Willis, Henry,
4 St. John st., Quebec, Can.
WILSON, BENJAMIN O.,
14 Milk st., Boston, Mass.
Wilson, Elmer L.,
St. Paul, Neb.
WINKELMANN, JOHN H.,
824 N. Carrollton ave., Baltimore, Md.
WINTER, JONAS,
202 Prospect st., Hagerstown, Md.
Wirthman, John G.,
1535 Grand ave., Kansas City, Mo.
Wirthman, Joseph C.,
18th st. & Troost ave., Kansas City, Mo.
Wisdom, Hugh,
426 State st., Chicago, Ill.
Wittich, Matthew H.,
1519 E. Franklin ave., Minneapolis, Minn.
Witting. Frederick F.,
2559 Humboldt st., Denver, Colo.
Wittmer, Joseph W., Jr.,
1347 Clay st., Dubuque, Ia.
Wolcott, A. Lincoln,
514 Arch st., Philadelphia, Pa.
Wolcott, Frank E.,
722 W. New York st., Indianapolis, Ind.

Wolf, Henry A.,,
2133 S. 3d st., St. Louis, Mo.
Wolff, Edward H.,
522 Washington ave., St. Louis, Mo.
Wolff, Gustave,
164 Elm st., New York, N. Y.
WOLTERSDORF, LOUIS,
171 Blue Island ave., Chicago, Ill.
Wood, Alonzo F., Jr.,
2 Church st., New Haven, Conn.
Wood, Edward S.,
688 Boylston st., Boston, Mass.
Wood, James P.,
2 Church st., New Haven, Conn.
Wood, John W.,
494 Broadway, Newport, R. I.
Woodman, Walter I.,
St. Augustine, Fla.
*Woodruff, Roderick S.*,
92 Prospect st., Waterbury, Conn.
Woods, Charles H. A.,
U. S. Marine Hospital, Chicago, Ill.
Woodworth, Charles B.,
254 W. Wayne st., Fort Wayne, Ind.
Woolsey, Jesse F.,
Care Eli Lilly & Co., Indianapolis, Ind.
Wooten, Thomas V.,
79 Dearborn st., Chicago, Ill.
Wrensch, Henry E., Jr.,
610 Bloomfield ave., Montclair, N. J.
Wright, Charles L.,
Allen & Dougherty sts., Webb City, Mo.
Wuensch, Charles,
494 Springfield ave., Newark, N. J.
Wulling, Frederick J.,
Minn. University, Minneapolis, Minn.
Wunderlich, Edward,
1415 Dryades st., New Orleans, La.
Wurmb, Theodore H.,
1923 E. Grand ave., St. Louis, Mo.
YORSTON, MATTHEW M.,
1063 Central ave., Cincinnati, O.
Young, Charles,
205 Franklin st., Johnstown, Pa.
Zabaldano, Alexander,
1124 Stockton st., San Francisco, Cal
Zemp, William R.,
P. O. Box 256, Camden, S. C.
ZIEGLER, PHILIP M.,
526 Penn st., Reading, Pa.
Zimmerman, Albert,
2113 S. Adams St., Peoria, Ill.
Zimmerman, Bernard,
45 E. 4th st., St. Paul, Minn.
Zinn, Charles E.,
501 Independence ave., Kansas City, Mo.
ZOELLER, EDWARD V.,
Main st., Tarboro, N. C.
Zottman, William H.,
1 Church st., Burlington, Vt.
Zuenkeler, J. Ferd,
1902 Vine st., Cincinnati, O.
Zwick, Karl G.,
1102 Madison ave., Covington, Ky.

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## LIST OF MEMBERS WHO HAVE RESIGNED SINCE PUBLICATION OF LAST REPORT.

| | | Elected. |
|---|---|---|
| Ardery, Lorimer, | Hutchinson, Kan., | 1895 |
| Bernheim, Moses R., | San Francisco, Cal., | 1902 |
| Bostick, Elmer E., | Philadelphia, Pa., | 1902 |
| Bowerman, Kenneth B., | San Francisco, Cal., | 1902 |
| Brown, Albert E., | Mobile, Ala., | 1887 |
| Burnett, George G., | San Francisco, Cal., | 1902 |
| Clark, Alfred W., | Denver, Colo., | 1902 |
| Colegaris, Joseph, | San Francisco, Cal., | 1902 |
| Dahlbender, George, | San Francisco, Cal., | 1902 |
| Drescher, August, | Newark, N. J., | 1902 |
| Gammon, Irving P., | Boston, Mass., | 1891 |
| Hall, Frank M., | Denver, Colo., | 1902 |
| Harper, Robert N., | Washington, D. C., | 1900 |
| Hart, Joseph, | Jackson, Miss., | 1901 |

| | | Elected. |
|---|---|---|
| Hatcher, Robert A., | Cleveland, O., | 1902 |
| Hicks, Henry T., | Raleigh, N. C., | 1898 |
| Johnson, Chas. B., | Middletown, O., | 1876 |
| Larrabee, John, | Melrose, Mass., | 1897 |
| Long, John P., | Isabela de Basilon, P. I., | 1901 |
| Milliken. John T., | St. Louis, Mo. | 1901 |
| Morison, J. Louis D., | Philadelphia, Pa., | 1895 |
| Nichols, John C., | New London, Conn., | 1886 |
| Ramaley, Francis, | Boulder, Colo., | 1897 |
| Rosenham, C. J., | Louisville, Ky., | 1902 |
| Sayre, Wm. H., | Newark, N. J., | 1877 |
| Stecher, Frederick W., | Cleveland, O., | 1902 |
| Suppiger, Albert E., | St. Louis, Mo., | 1901 |
| Topping, Chas. O., | Cass City, Mich., | 1889 |
| Wilson, Oscar H., | Philadelphia, Pa., | 1902 |

## LIST OF MEMBERS WHO HAVE DIED SINCE PUBLICATION OF LAST REPORT.

| | | Elected. |
|---|---|---|
| Ewell, Ervin E., | Washington, D. C., | 1898 |
| Frank, Herman O., | Milwaukee, Wis., | 1898 |
| Geddis, Frank, | Washington, D. C., | 1902 |
| Golden, Lee H., | McLoud, Okla. Terr., | 1900 |
| Gove, David M., | San Francisco, Cal., | 1902 |
| Hassebrock, Henry F., | St. Louis, Mo., | 1884 |
| McDonald, George, | Kalamazoo, Mich., | 1871 |
| Milhau, Edward L., | New York, N. Y., | 1858 |
| Miller, Wm. H.. | New Philadelphia, O., | 1898 |
| Schafhirt, Adolph J., | Washington, D. C., | 1876 |
| Schlaepfer, Henry J., | Evansville, Ind., | 1879 |
| *Viallon, Paul L.*, | Bayou Goula, La., | 1870 |
| Warren, Wm. M., | Detroit, Mich., | 1889 |
| Whitney, Henry M., | North Andover Depot, Mass., | 1859 |
| Williams, Wm. H., | Wheeling, W. Va., | 1880 |
| Wood, Mason B, | Providence, R. I., | 1882 |

## LIST OF MEMBERS DROPPED FROM THE ROLL FOR NON-PAYMENT OF DUES, ACCORDING TO ARTICLE III., CHAPTER VII., OF THE BY-LAWS.

(PUBLISHED IN ACCORDANCE WITH A GENERAL RULE, ADOPTED AT MONTREAL, CANADA, AUGUST, 1896. SEE PAGE 17, VOLUME 44, PROCEEDINGS.)

| | | Elected. |
|---|---|---|
| Bennett, James N., | Hartford, Conn., | 1900 |
| Bobbitt, James H., | Baltimore, Md., | 1894 |
| Brigham, Lawrence S., | Montgomery, Ala., | 1898 |
| Buck, John L., | Chelsea, Mass., | 1883 |
| Burge, James O., | Nashville, Tenn., | 1878 |

| | | Elected. |
|---|---|---|
| Carlson, Swan B., | Wilmar, Minn., | 1897 |
| Chapman, Isaac C., | Newburgh, N. Y. | 1887 |
| Erb, Charles S., | New York, N. Y., | 1898 |
| Ewing, John, | New York, N. Y., | 1893 |
| Ewing, Mary S., | Kirksville, Mo., | 1898 |
| Farrar, Samuel R., | Lebanon, Mo., | 1891 |
| Fisher, Elbert E., | Bridgeport, Conn., | 1892 |
| Flexon, Charles, | Winnipeg, Canada, | 1897 |
| French, John I., | Boston, Mass., | 1894 |
| Graham, Clarence M., | Manila, P. I., | 1897 |
| Greer, Samuel R., | Pittsburg, Texas, | 1900 |
| Greiner, William E., | Sherman, Texas, | 1892 |
| Harrison, Richard H. M., | Richmond, Va., | 1895 |
| Henderson, Archibald K., | Pittsburg, Pa., | 1888 |
| Higgins, Albert W., | Rutland, Vt., | 1895 |
| Ires, Orvin F. | Hartford, Conn., | 1900 |
| Keefer, Charles D., | Chambersburg, Pa., | 1891 |
| Lanctot, Henri, | Montreal, Canada, | 1894 |
| Ligon, J. Temple. | Anderson, S. C., | 1900 |
| Lockie, James A., | Buffalo, N. Y., | 1896 |
| Lohmeyer, Henry L., | Pittsburg, Pa., | 1900 |
| Lowe, John W., | New Haven, Conn., | 1898 |
| Lynch, Frank K., | Cambridge Mass., | 1897 |
| McClearn, Henry T., | Boothbay Harbor, Me. | 1896 |
| Meisburger, William J., | Webster Groves, Mo., | 1900 |
| Murphy, John P., | North Andover, Mass., | 1900 |
| Nicholson, Edgar L., | New Whatcom, Washington, | 1900 |
| Potter, William R., | Providence, R. I., | 1894 |
| Rauch, Henry, | Minneapolis, Minn., | 1897 |
| Robinson, Ernest F., | Huntingdon Valley, Pa., | 1889 |
| Rogers, Henry H., | Kankakee, Illinois, | 1895 |
| Schmidt, Oscar W., | Chicago, Illinois, | 1889 |
| Skinner, William H., | Pocahontas, Ark., | 1894 |
| Smith, Edward S., | Port Henry, N. Y., | 1890 |
| Snook, William H., | Richmond, Va., | 1900 |
| Stedem, Laurence S. A., | Philadelphia, Pa., | 1900 |
| Thomas, Oscar E., | Columbus, S. C., | 1882 |
| Treherne, John C., | Memphis, Tenn., | 1894 |
| Tsheppe, Adolph, | New York, N. Y., | 1876 |
| Walker, Thomas A., | Charlotte, N. C., | 1900 |
| Walts, Charles C., | Hagerstown, Md., | 1898 |
| Wearn, William H., | Charlotte, N. C., | 1888 |
| White, George H., | Jersey City, N. J., | 1868 |
| Wiesel, John M., | Baltimore, Md., | 1898 |

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R.

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